TOSHIBA

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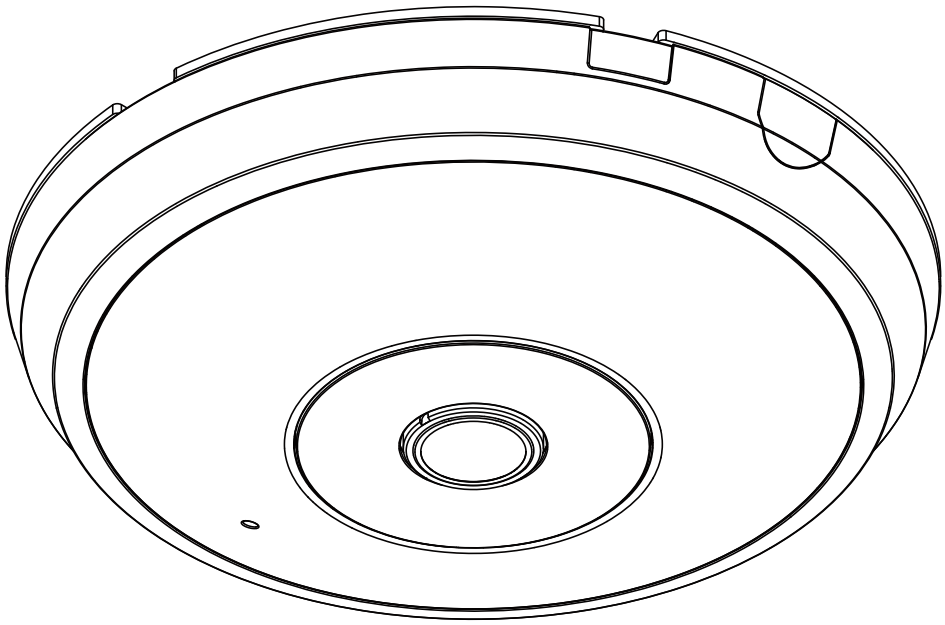
NETWORK CAMERA

Model: IK-WF51A

User's Manual



For information on our latest products and peripheral devices, refer to the following Website:

■ http://www.toshibasecurity.com

If the URL changes, refer to the Toshiba website (http://www.toshiba.com/).

Table of Contents

FCC (USA)-INFORMATION

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

USER-INSTALLER CAUTION: Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party.

Thank you for purchasing the IK-WF51A Network Camera. Before using the camera, read this User's Manual carefully to ensure correct usage. After reading this User's Manual, save it for future reference.

The design, specifications, software, and User's Manual contents are subject to change without prior notice.

Terms

- The term "OS" is used in this manual to indicate operating systems compatible with this product.

  -- Microsoft® Windows® 7 Professional Edition

NOTE

- The performance of the network camera may vary depending on the network environment.
- When using multiple network cameras, the appropriate network switch and PC are required.
- This camera does not support MAC-PC.

Important Safeguards

1. Read Instructions

Read all the safety and operating instructions before operating the product.

2. Retain Instructions

Retain the safety instructions and user's manual for future reference.

3. Warnings

Comply with all warnings on the product and in the user's manual.

4. Follow Instructions

Follow all operating and use instructions.

5. Cleaning

Disconnect this camera from the power supply before cleaning.

6. Attachments

Do not use attachments not recommended by the camera manufacturer as they may pose safety risks.

7. Water and Moisture

Do not use this camera near water. Some examples are: near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.

8. Accessories

Do not place this camera on an unstable cart, stand, tripod, bracket or table. The camera may fall, causing serious injury to a person, or serious damage to the product. Use only with stand, tripod,bracket,or table recommended by the manufacturer, or sold with the camera. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

9. Ventilation

This camera should never be placed near or over a radiator or heat register. If this product is placed in a built-in installation, verify that there is proper ventilation so that the camera temperature operates within the recommended temperature range.

10. Power Sources

This camera should be operated only from the type of power source indicated on the information label. If you are not sure of the type of power supply at your location, consult your product dealer.

11. Power-Cord Protection

Power cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, screws and the point where they exit the product.

12. Installation

Install this camera on a secure part of the ceiling or wall. If installed on an unsecured location, the camera could fall causing injury and damage.

13. Lightning

For additional protection on this camera during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the power supply and cable system. This will prevent damage to the camera due to lightning and power-line surges. If lightning occurs, do not touch the unit or any connected cables in order to avoid electric shock.

14. Overloading

Do not overload the power supply or extension cords as this can result in a risk of fire or electric shock.

15. Object and Liquid Entry

Never push objects of any kind into this camera through openings as they may touch dangerous electrical points or short-out parts that could result in a fire or electrical shock. Never intentionally spill liquid of any kind on the camera.

16. Servicing

Do not attempt to service this camera yourself as opening or removing covers may expose you to dangerous electrical or other hazards. Refer all servicing to qualified service personnel.

17. Damage Requiring Service

Disconnect this camera from the power supply and refer servicing to qualified service personnel under the following conditions.

a. When the power-supply cord or plug is damaged.

b. If liquid has been spilled, or objects have fallen into the camera.

c. If the camera has been submerged in water.

d. If the camera does not operate normally by following the operating instructions in the user's manual. Adjust only those controls that are covered by the user's manual as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the camera to its normal operation.

e. If the camera has been dropped or the cabinet has been damaged.

f. When the camera exhibiting a distinct change in performance which indicates a need for service.

g. Other trouble.

18. Replacement Parts

When replacing parts, be sure the service technician uses parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

19. Safety Check

Upon completion of any service or repairs to this camera, ask the service technician to perform safety checks to determine that the camera is in proper operating condition.

Important Safeguards (Cont.)

CAUTION TO REDUCE THE RISK OF ELECTRIC SHOCK.

DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

FIELD INSTALLATION MARKING:

WORDED: “THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO ALL LOCAL CODES.”

This product is intended to be supplied by a Listed Power Adapter with LPS, rated PoE 42.5-57Vdc, 0.55-0.41A : 12V DC, 2.1A.

The product is not likely to require connection to an Ethernet network with outside plant routing, including campus environment; and the installation instructions clearly state that the ITE is to be connected only to PoE networks without routing to the outside plant.

Ce produit est conçu pour être alimenté par un adaptateur secteur Listed avec LPS, classé PoE 42.5-57Vdc, 0.55-0.41A : 12V DC, 2.1A.

Le produit ne est pas susceptible de nécessiter une connexion à un réseau Ethernet avec l'extérieur routage des plantes, y compris l'environnement de campus; et les instructions d'installation clairement que l' état ITE doit être raccordé uniquement aux réseaux PoE sans routage vers le installations extérieures.

Notes on Use and Installation

- **Do not aim the camera at the sun**

  Never aim the camera at the sun even with the camera power off.

- **Do not shoot intense light**

  Intense light such as a spotlight may cause a bloom or smear. A vertical stripe may appear on the screen. However, this is not a malfunction.

- **Treat the camera with care**

  Dropping or subjecting the camera to intense vibration may cause it to malfunction.

- **Avoid Volatile Liquid**

  Do not use volatile liquids, such as an insect spray, near the unit. Do not leave rubber or plastic products touching the unit for a long time. They will leave marks on the finish. Do not use a chemically saturated cloth.

- **Never touch internal parts**

  Do not touch the internal parts of the camera other than the parts specified.

- **Keep the camera installation away from video noise**

  If cables are wired near electric lighting wires or a TV set, noise may appear in images. In this event relocate cables or reinstall equipment.

- **Check the ambient temperature and humidity**

  Avoid using the camera where the temperature is hotter or colder than the specified operating range. Doing so could affect the internal parts or cause the image quality to deteriorate. Special care is required to use the camera at high temperature and humidity.

- **Should you notice any trouble**

  If any trouble occurs while you are using the camera, turn off the power and contact your dealer. If you continue to use the camera when there is something wrong with it, the trouble may get worse and an unpredictable problem may occur.

Precautions for Use

Disclaimer

We disclaim any responsibility and shall be held harmless for any damages or losses incurred by the user in any of the following cases:

1. Fire, earthquake or any other act of God; acts by third parties; misuse by the user, whether intentional or accidental; use under extreme operating conditions.
2. Malfunction or non-function resulting in indirect, additional or consequential damages, including but not limited to loss of expected income and suspension of business activities.
3. Incorrect use not in compliance with instructions in this user's manual.
4. Malfunctions resulting from misconnection to other equipment.
5. Repairs or modifications made by the user or caused to be made by the user and carried out by an unauthorized third party.

Notwithstanding the foregoing, Toshiba's liabilities shall not, in any circumstances, exceed the purchase price of the product.

Copyright and Right of Portrait

There may be a conflict with the Copyright Law and other laws when a customer uses, displays, distributes, or exhibits an image picked up by the camera without permission from the copyright holder. Please also note that transfer of an image or file covered by copyright is restricted to use within the scope permitted by the Copyright Law.

Protection of Personal Information

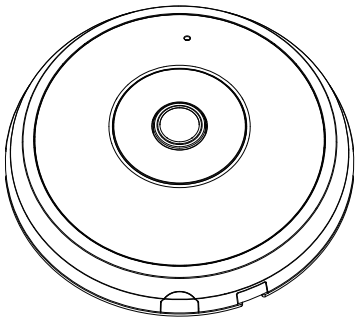
Images taken by the camera that reveal the likeness of an individual person may be considered personal information. To disclose, exhibit or transmit those images over the internet or otherwise, consent of the person may be required.

Usage Limitation

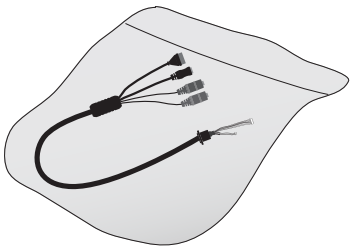
The product is not designed for any "critical applications." "Critical applications" means life support systems, exhaust or smoke extraction applications, medical applications, commercial aviation, mass transit applications, military applications, homeland security applications, nuclear facilities or systems or any other applications where product failure could lead to injury to persons or loss of life or catastrophic property damage.
Accordingly, Toshiba disclaims any and all liability arising out of the use of the product in any critical applications.

Package Contents

- IK-WF51A

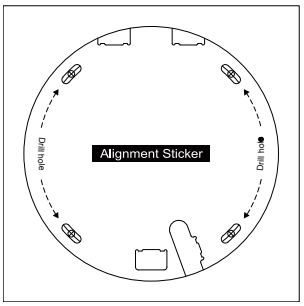


- Power & I/O cable

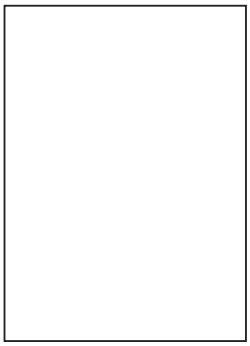


- CD-ROM

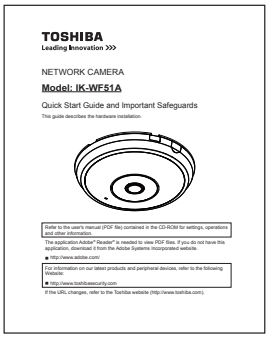
- Alignment Sticker



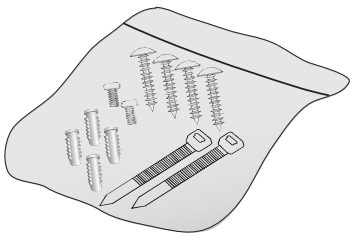
- Warranty Card



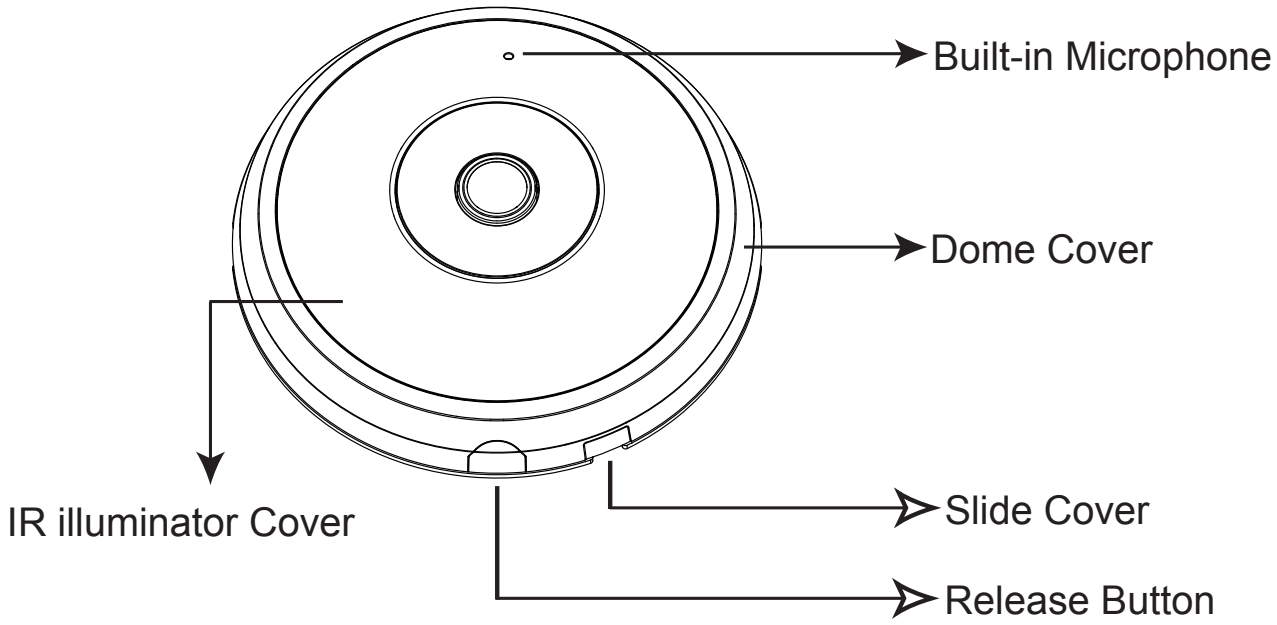
- Quick Start Guide and Important Safeguards



- Screws / Anchors / Cable ties

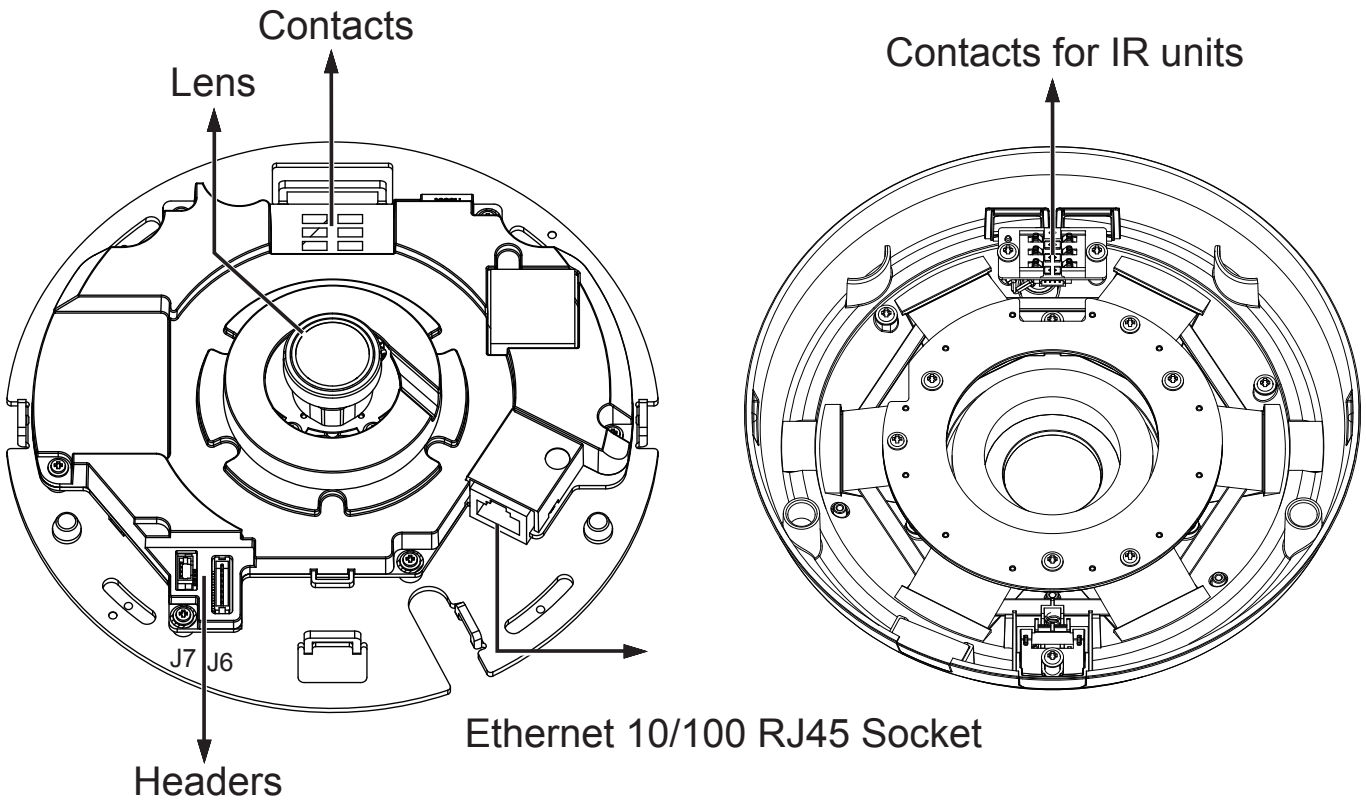


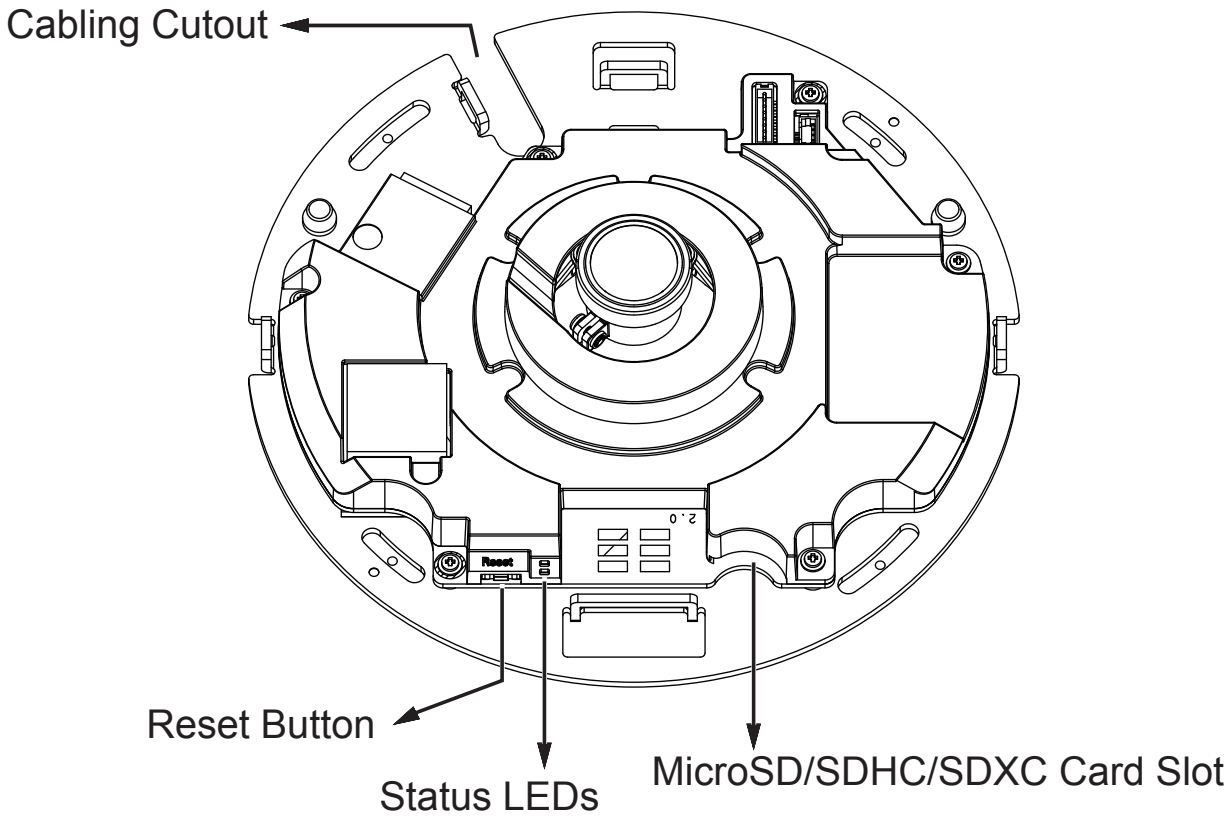
Physical Description



CAMERA MAIN UNIT

- Inner View





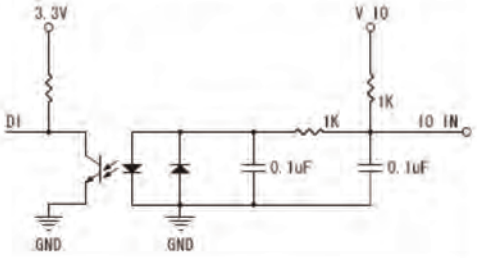
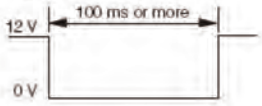
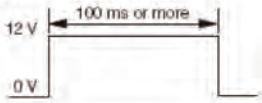
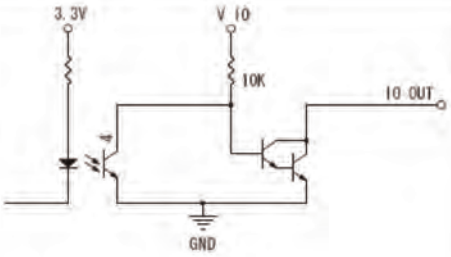
General I/O Terminal Block

This Network Camera provides a general I/O terminal block which is used to connect external input / output devices.

NOTE

- 3.3V DC is outputted from the terminal when connected to a power supply.

The diagrams below apply when "Digital Input" is used for an alarm input.

	Internal Circuit	Signal Condition
Digital Input		Active state is low.  Active state is high. 
Digital Output		MAX. 12V DC, 50 mA

Status LED

The LED indicates the status of the Network Camera.

Item	LED Status	Description
1	Steady Red	Power on and system booting
	Red LED off	Powered off
2	Steady Red + blinking Green every 1 sec. (Green LED on for 1 sec and off for another)	Network heartbeat
	Steady Red + Green LED off	Network disconnected
3	Blinking Red every 0.15 sec. + Blinking Green every 1 sec. (Red LED on for 0.15 sec. and Green LED on for 1 sec. and off for another)	Upgrading firmware
4	Blinking Red every 0.15 sec. + blinking Green every 0.15 sec	Restoring defaults

Hardware Reset

The reset button is used to reset the system or restore the factory default settings. Occasionally resetting the system can return the camera to normal operation. If the system problems remain after resetting, restore the factory settings and install again.

Reset:Hold for about 3 seconds and release the recessed reset button with a paper clip or small object. Wait for the Network Camera to reboot.

Restore:Press and hold the recessed reset button until the status LED rapidly blinks. It takes about 10 seconds. Note that all settings will be restored to factory default. Upon successful restore, the status LED will blink during normal operation.

Restoring the factory defaults will erase any previous settings.

SD/SDHC/SDXC Card and Capacity

This network camera is compliant with Micro SD/SDHC/SDXC 64GB and other preceding standard Micro SD cards for local storage.

NOTE

- There is a limit to the number of rewrites that is possible with the SD memory card. Replacing the SD memory card when performing periodic maintenance of the camera is recommended.
- Do not use 512MB and below SD memory cards.
- The Camera system reserves approximately 60MB in SD memory cards. Any images are not recordable on this space.
- Carefully read the User's guide, precautions on use, and any other information supplied with a purchased memory card.
- An SD memory card can be used for repeated storage. The lifespan (number of rewrites possible) of an SD memory card is greatly affected by the capacity of the SD memory card.
- Do not use a memory card containing the data recorded by another device with the camera as this may result in the camera not functioning correctly.
- Do not modify, overwrite the data, or change the folder name of an SD memory card. It may result in the camera not to function correctly.

If you Power-OFF or remove the SD memory card from camera, you have to turn OFF the event status in Event window on page 108 and the recording status in Recording window on page 121 preliminarily.

Hardware Installation

Please verify that your product package contains all the accessories listed in the Package Contents listed on page 11. Depending on the user's application, an Ethernet cable may be needed. The Ethernet cable should meet the specs of UTP Category 5 or higher.

Hardware Installation is shown in the Quick Start Guide(QSG). Please refer to page 13 of the QSG.

Network Deployment

In this user's manual, "User" refers to whoever has access to the Network Camera, and "Administrator" refers to the person who can configure the Network Camera and grant user access to the camera.

Network Deployment is shown in the Quick Start Guide(QSG). Please refer to page 18 of the QSG.

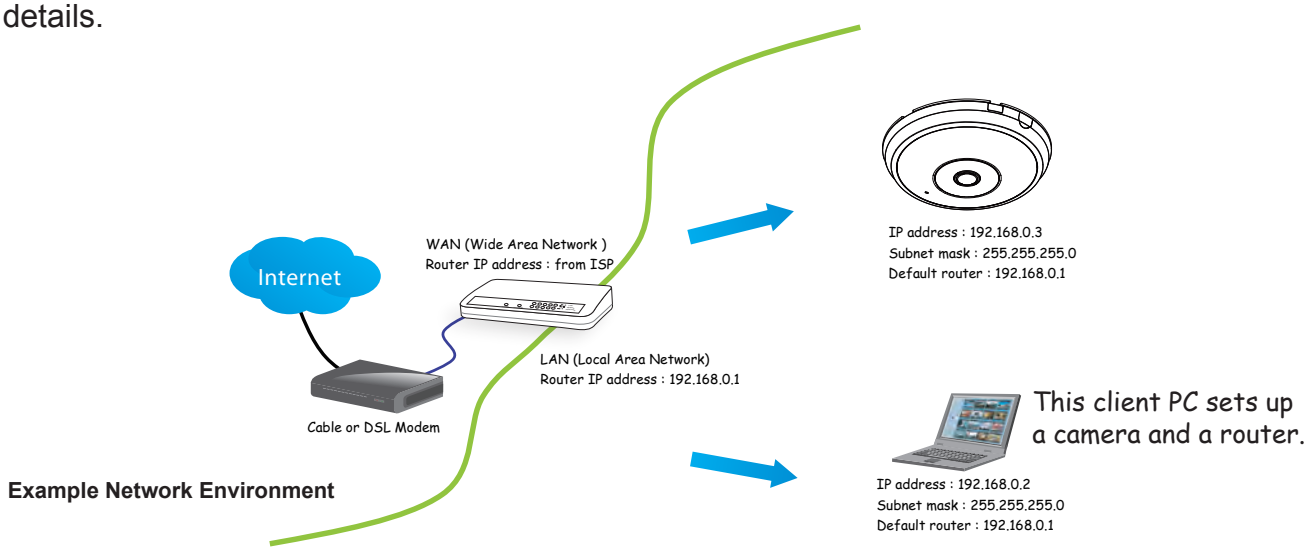
Setting up the Network Camera over the Internet

There are several ways to set up the Network Camera over the Internet. The first way is to set up the Network Camera behind a router. The second way is to utilize a static IP. The third way is to use PPPoE.

Internet connection via a router

Before setting up the Network Camera over the Internet, make sure you have a router and follow the steps below.

1. Connect your Network Camera behind a router, the Internet environment is illustrated below. Regarding how to obtain your IP address, please refer to Software Installation on page 19 for details.



Example Network Environment

2. In this case, if the Local Area Network (LAN) IP address of your Network Camera is 192.168.0.3, please forward the following ports for the Network Camera on the router.

- HTTP port: default is 80
- RTSP port: default is 554
- RTP port for audio: default is 5558
- RTCP port for audio: default is 5559
- RTP port for video: default is 5556
- RTCP port for video: default is 5557

If you have changed the port numbers on the Network page, please open the ports accordingly on your router. For information on how to forward ports on the router, please refer to your router's user's manual.

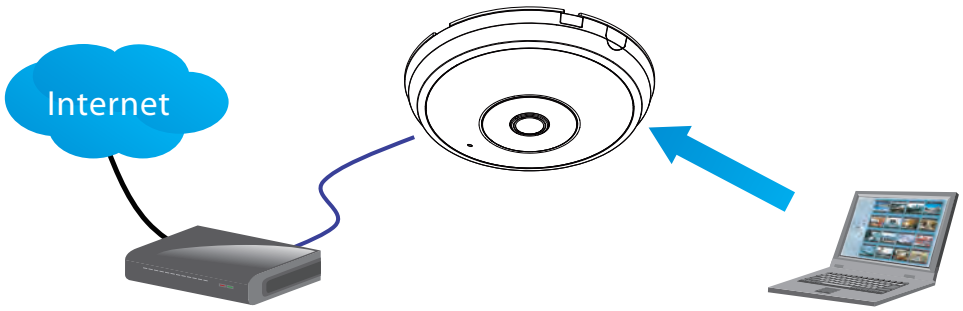
3. Determine the public IP address of your router provided by your ISP (Internet Service Provider). Use the public IP and the secondary HTTP port to access the Network Camera from the Internet. Please refer to Network Type on page 60 for details.

Internet connection with static IP

Choose this connection type if you are required to use a static IP for the Network Camera. Please refer to LAN on page 60 for details.

Internet connection via PPPoE (Point-to-Point over Ethernet)

Choose this connection type if you are connected to the Internet via a DSL Line. Please refer to PPPoE on page 61 for details.

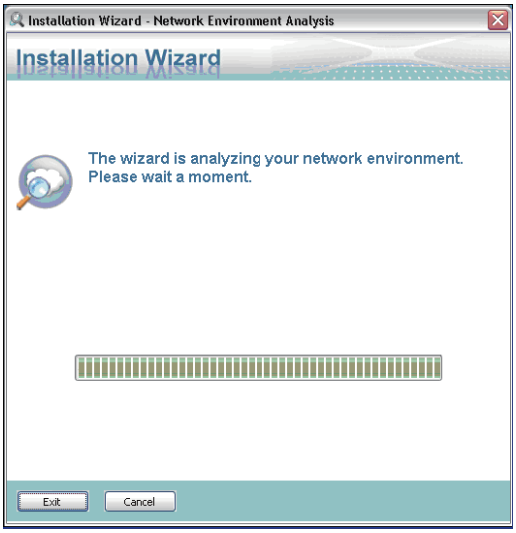


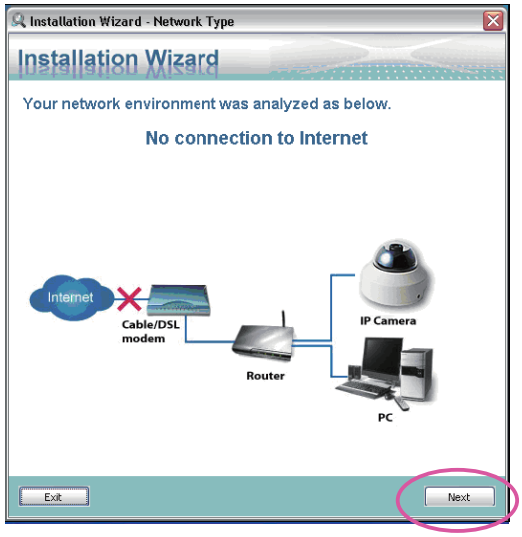
Software Installation

Installation Wizard (IW), a free-bundled software packaged in the product CD, helps to set up your Network Camera in a LAN.

1. Install the IW under the Software Utility directory from the software CD. Double click the IW shortcut on your desktop to launch the program.

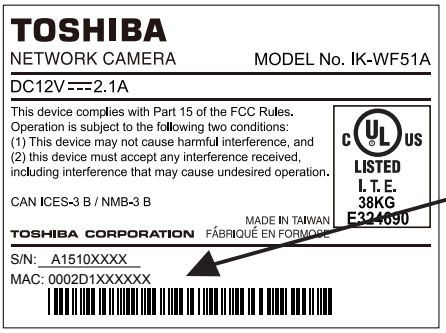
2. The program will analyze your network environment. After your network environment is analyzed, please click [Next] to continue the program.

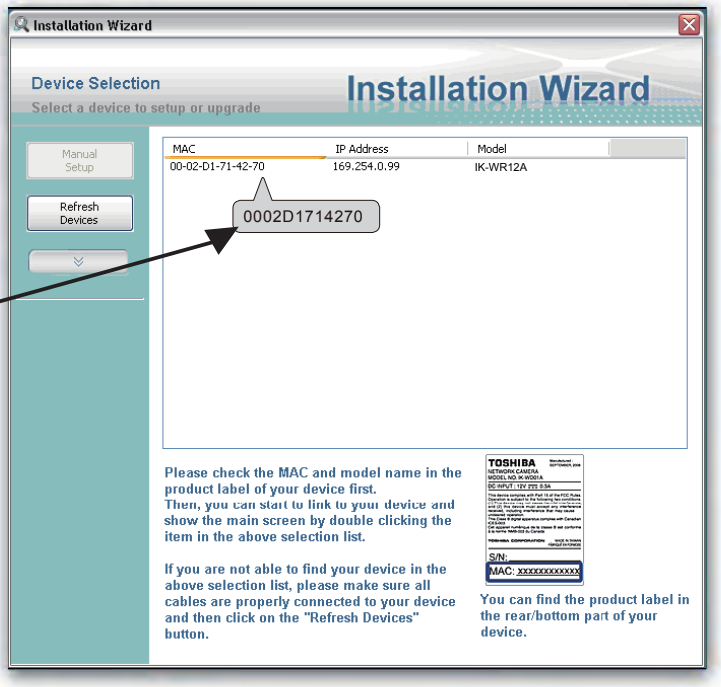




3. The program will search for Network Cameras on the same LAN.

4. After searching, the main installer window will pop up. Click on the MAC and model name which matches the MAC of the camera.





NOTE

- This Software is proprietary client software for TOSHIBA Network Camera.

Ready to Use

1. Access the Network Camera on the LAN.
2. Retrieve live video through a web browser.

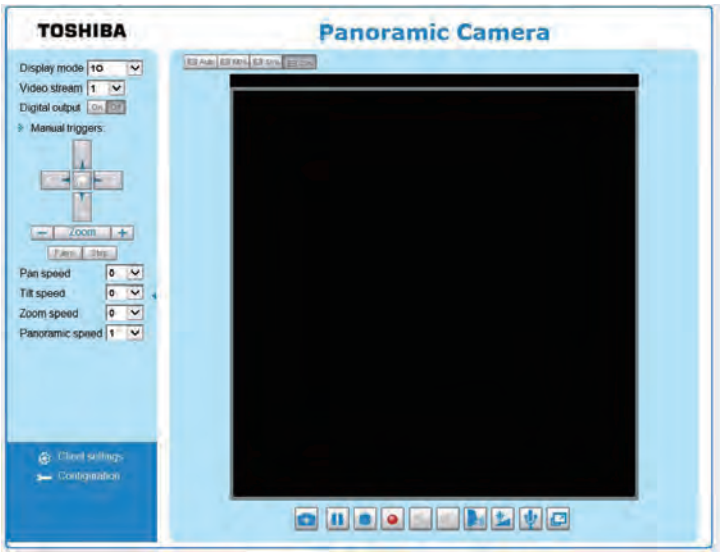
Accessing the Network Camera

This chapter explains how to access the Network Camera through web browsers, RTSP players and 3GPP-compatible mobile devices.

Using Web Browsers

Use Installation Wizard to access the Network Cameras on the LAN.
If your network environment is not a LAN, follow these steps to access the Network Camera:

1. Launch your web browser (Microsoft® Internet Explorer).
2. Enter the IP address of the Network Camera in the address field. Press **Enter**.
3. The live video will be displayed in your web browser.
4. If it is the first time installing the network camera, an information bar will pop up. Follow the instructions to install the required plug-in on your computer.

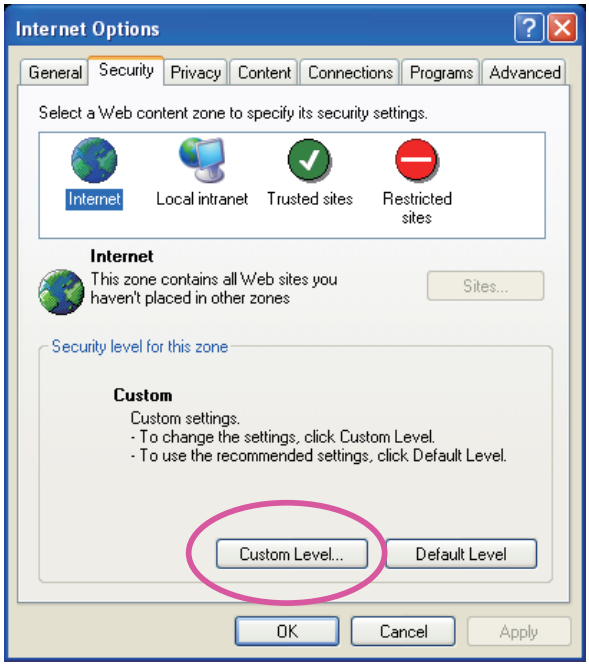


IMPORTANT

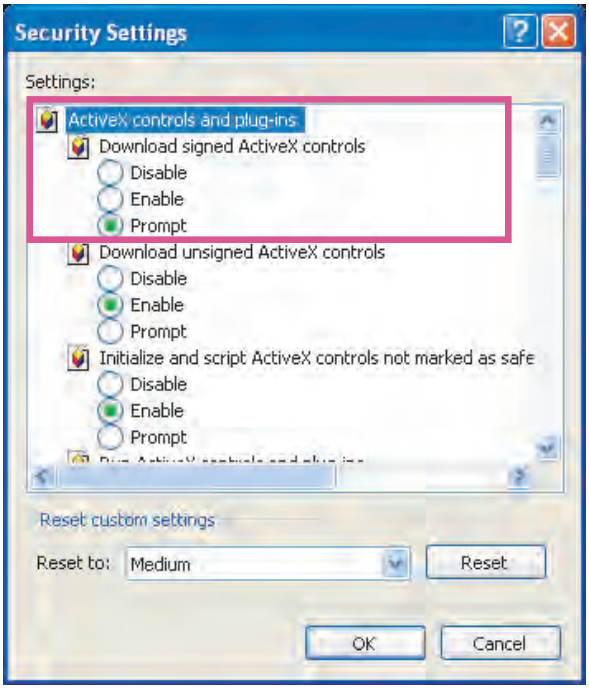
► *By default, the Network Camera is not password-protected. To prevent unauthorized access, it is highly recommended to set a password for the Network Camera.*
For more information about how to enable password protection, please refer to Security on page 49.

► *If you see a dialog box indicating that your security settings prohibit running ActiveX® Controls, please enable the ActiveX® Controls for your browser.*

1. Choose Tools > Internet Options > Security > Custom Level.



*2. Look for Download signed ActiveX® controls; select Enable or Prompt. Click **OK**.*



3. Refresh your web browser, then install the Active X® control. Follow the instructions to complete installation.

NOTE

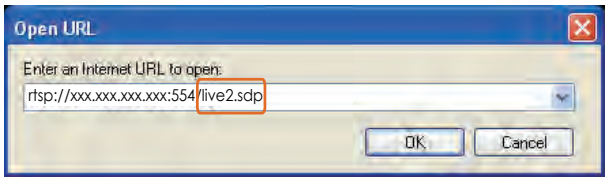
- Currently the Network Camera utilizes 32-bit Active X® plug-in. You CAN NOT open a Configuration/view session with the camera using a 64-bit IE browser.

Using RTSP Players

To view the H.264/MPEG-4 streaming media using RTSP players, you can use players that support RTSP streaming.

1. Launch the RTSP player.
2. Choose File > Open URL. A URL dialog box will pop up.
3. The address format is rtsp://<ip address>:<rtsp port>/<RTSP streaming access name for stream1, stream2 or stream3>

As most ISPs and players only allow RTSP streaming through port number 554, please set the RTSP port to 554. For more information, please refer to RTSP Streaming on page 69.
For example:



4. The live video will be displayed in your player.
   For more information on how to configure the RTSP access name, please refer to RTSP Streaming on page 69 for details.

Using 3GPP-compatible Mobile Devices

To view the streaming media through 3GPP-compatible mobile devices, make sure the Network Camera can be accessed over the Internet. For more information on how to set up the Network Camera over the Internet, please refer to Setup the Network Camera over the Internet on page 17.

To utilize this feature, please check the following settings on your Network Camera:

1. Because most players on 3GPP mobile phones do not support RTSP authentication, make sure the authentication mode of RTSP streaming is set to disable.
   For more information, please refer to RTSP Streaming on page 69.

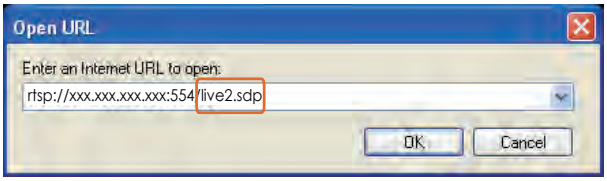
2. As the bandwidth on 3G networks is limited, you will not be able to use a large video size. Please set the video and audio streaming parameters as listed below.

Video Mode	H.264
Frame size	176 x 144
Maximum frame rate	5 fps
Intra frame period	1S
Video quality (Constant bit rate)	40kbps
Audio type (GSM-AMR)	12.2kbps

3. As most ISPs and players only allow RTSP streaming through port number 554, please set the RTSP port to 554. For more information, please refer to RTSP Streaming on page 69.

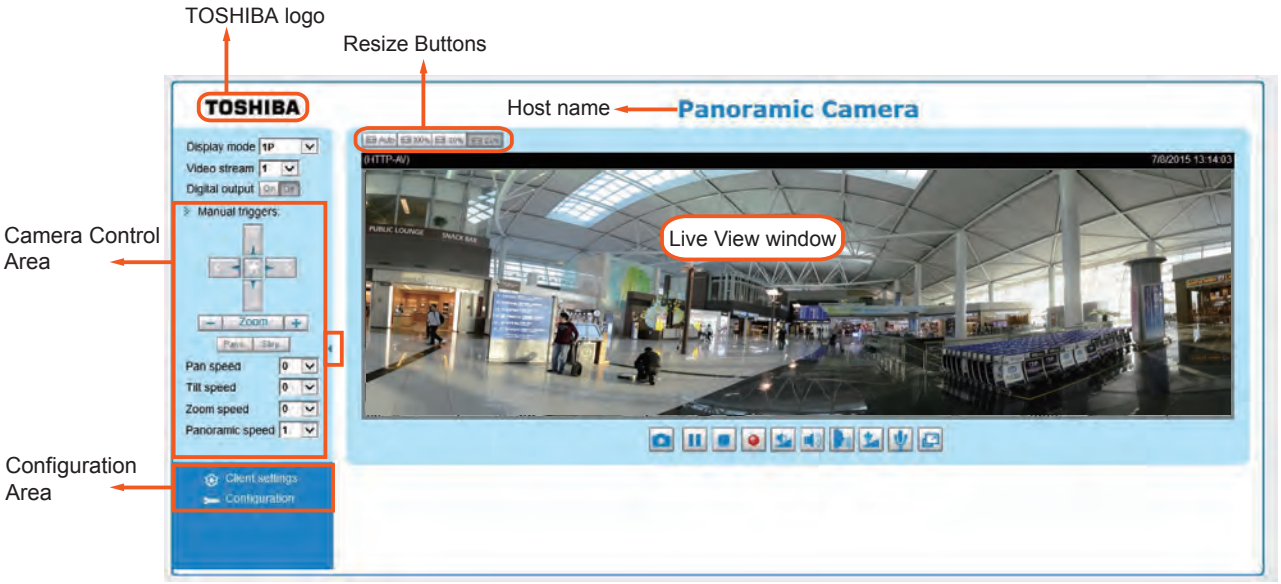
4. Launch the player on the 3GPP-compatible mobile devices.

5. Type the following URL commands into the player.
   The address format is rtsp://<public ip address of your camera>:<rtsp port>/<RTSP streaming access name for stream # with small frame size and frame rate>.
   For example:



Main Page

This chapter explains the screen elements on the main page. It is composed of the following sections: TOSHIBA Logo, Host Name, Camera Control Area, Configuration Area, and Live Video Window.



TOSHIBA Logo

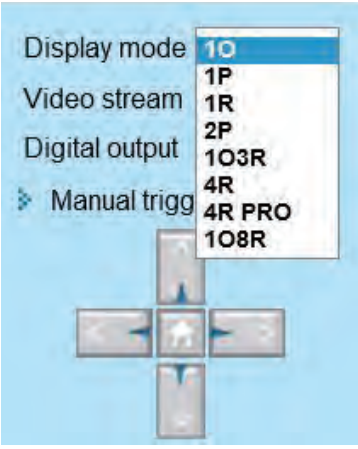
Click this logo to visit the TOSHIBA website.

Host Name

The host name can be customized to fit your needs. For more information, please refer to System > General Settings on page 38.

Camera Control Area

Display mode: This is a configuration menu exclusively designed for Panoramic cameras. Due to the fisheye lens' wide coverage of hemispheric and panoramic views and to manipulate the details within, the following display modes are provided:



1O - One Original hemispheric view.
1P - One Panoramic view
1R - One Regional view
1P2R - One Panoramic and two Regional views (Wall mount)
2P - Two Panoramic views
1P3R - One Panoramic and three Regional views (Wall mount)
1O3R - One Original and three Regional views
4R - Four Regional views
4R PRO - Four Regional views interactively displayed when the field of view changes in any of the views
1O8R - One Original and eight Regional views

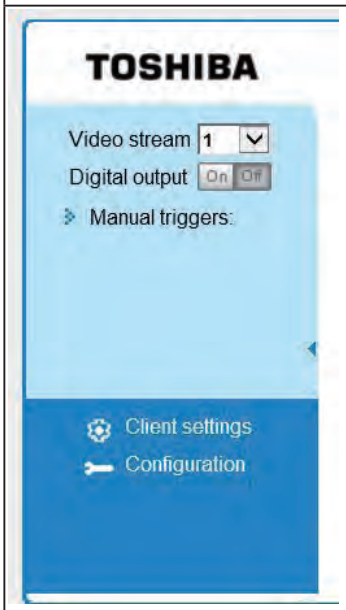
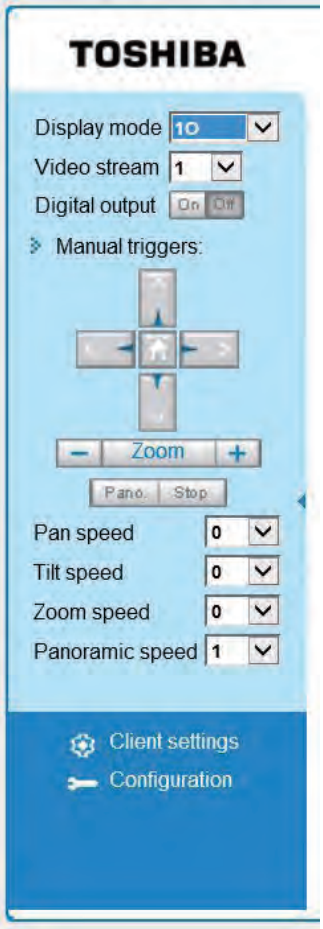
* Most display modes are available in the Ceiling mount type.

IMPORTANT:

The Local dewarp function is designed for use with 3rd-party software that did not implement the dewarp plug-ins. A video stream can be dewarped on the camera into a regional or panoramic view before being sent to the client side. However, since the video has already been dewarped into a more viewable rectilinear view, you can not exert PTZ control or change the view angle on the client computer.

When using the Local dewarp, you should configure the view angle of a regional view in the PTZ > PTZ settings window.

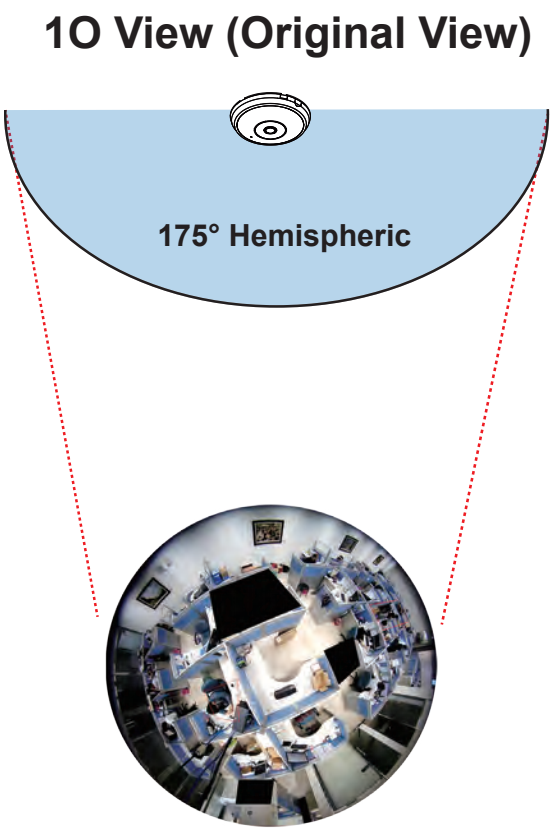
Below are the appearances of the control panel when the Local dewarp function is enabled or disabled. The **PTZ panel** and the **Display mode** menu disappear when a video stream is using the Local dewarp function. See page 88 for more information.

Local dewarp (on camera)	Dewarp by client-side plug-ins
	

1O (Original) Display mode:

When mounted on a ceiling, the panoramic camera can cover an approximately 50 m² surveillance area (hung at a height of approximately 3 meters), while still keeping details in videos with recognizable facial features of people trafficking through the area.

The 1O view is especially adequate for taking an over-view glimpse of surveillance area with a ceiling mount camera.



1P (Single Panoramic) Display mode:

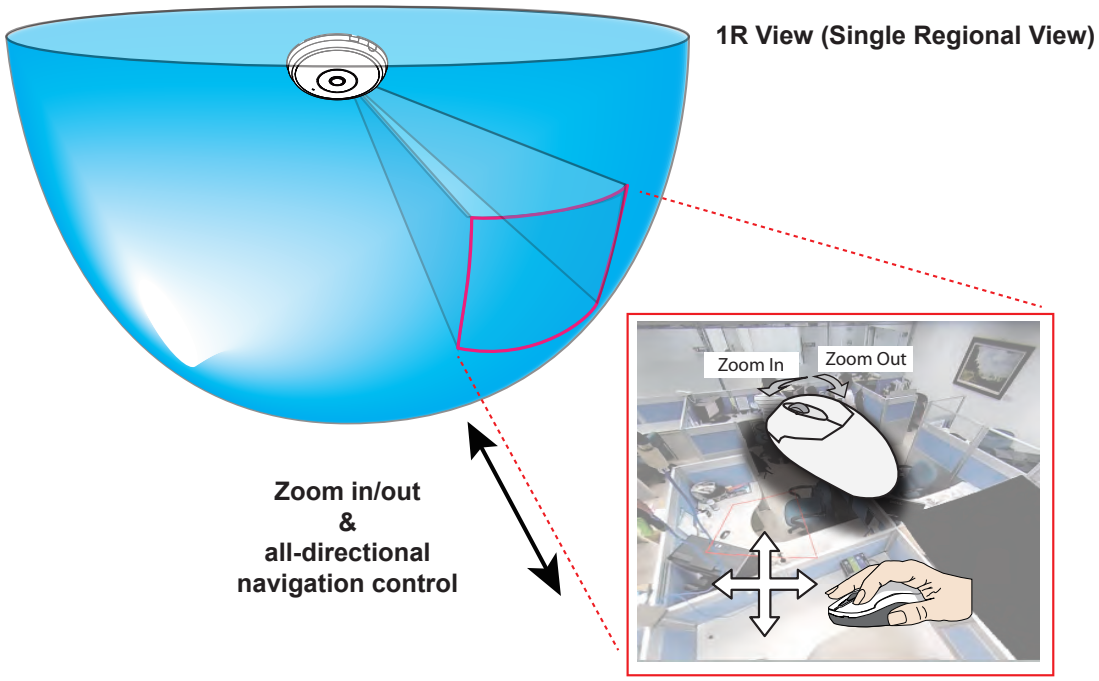
With image correction firmware algorithms, the hemispheric image is transformed into a rectilinear stripe in the 1P display mode. Viewers can use the PTZ panel or simply use mouse control to quickly move through the 360º panoramic view. (Mouse control on the Panoramic view is available with the Ceiling mount type.)
Note that while the 1P view is apt for an overview, the Zoom in/out function does not apply in this mode.

IMPORTANT:

If the **Local dewarp** mode is selected for a video stream, the mouse control on the screen will be disabled. For example, if stream #1 is configured into the 1R mode (see description on the next page), its view angle will not be configurable using the mouse control.

1R (Single Regional) Display mode:

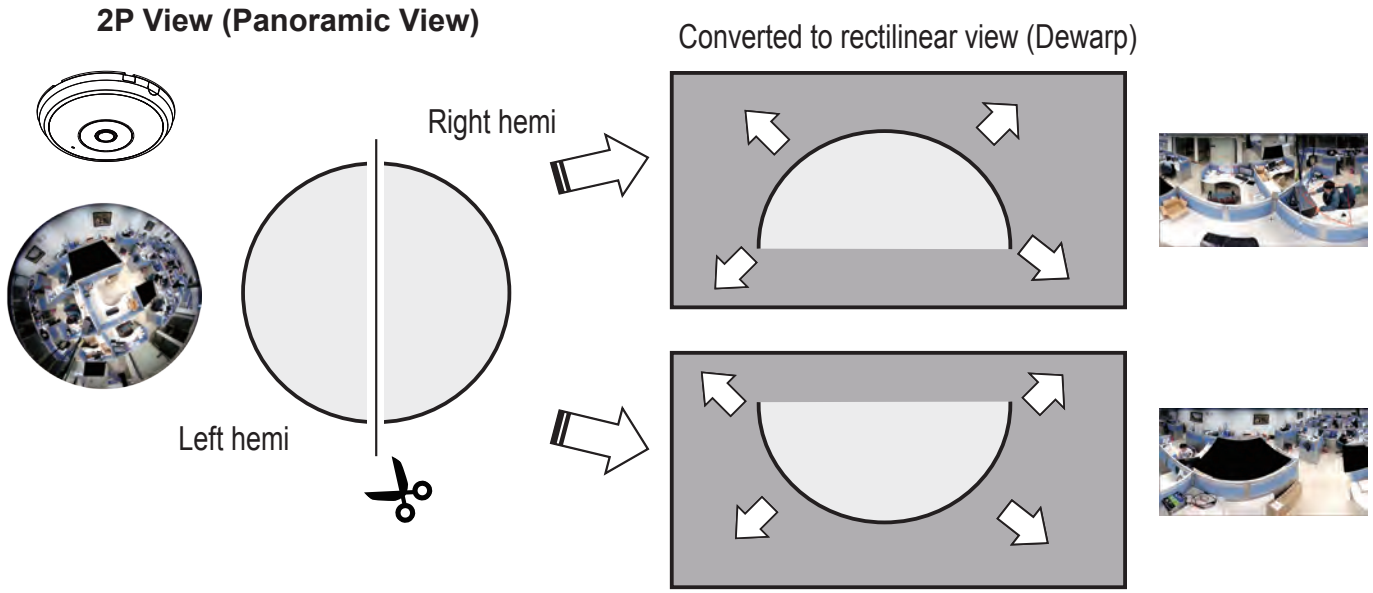
The 1R mode provides access to one image section within the hemisphere. You can zoom in or out (using the mouse wheel or PTZ panel) or travel to other areas in the hemisphere using mouse clicks and swipes. A single click on a particular object can bring the object to the center of your view window. Click and hold down the left mouse button, and you can swipe the view both horizontally and vertically. Double click on a view window can bring to the center of hemisphere.



2P (Dual Panoramic View) Display mode:

Similar to 1P, the 2P display mode provides simultaneous access to both the left and right sections of a hemisphere. Both panoramic views are corrected into a more viewable dewarped image. Viewers can use a mouse click and swipe to quickly scroll horizontally through the surveillance area.

* Note that the dividing line falls approximately on the center of the TOSHIBA logo.



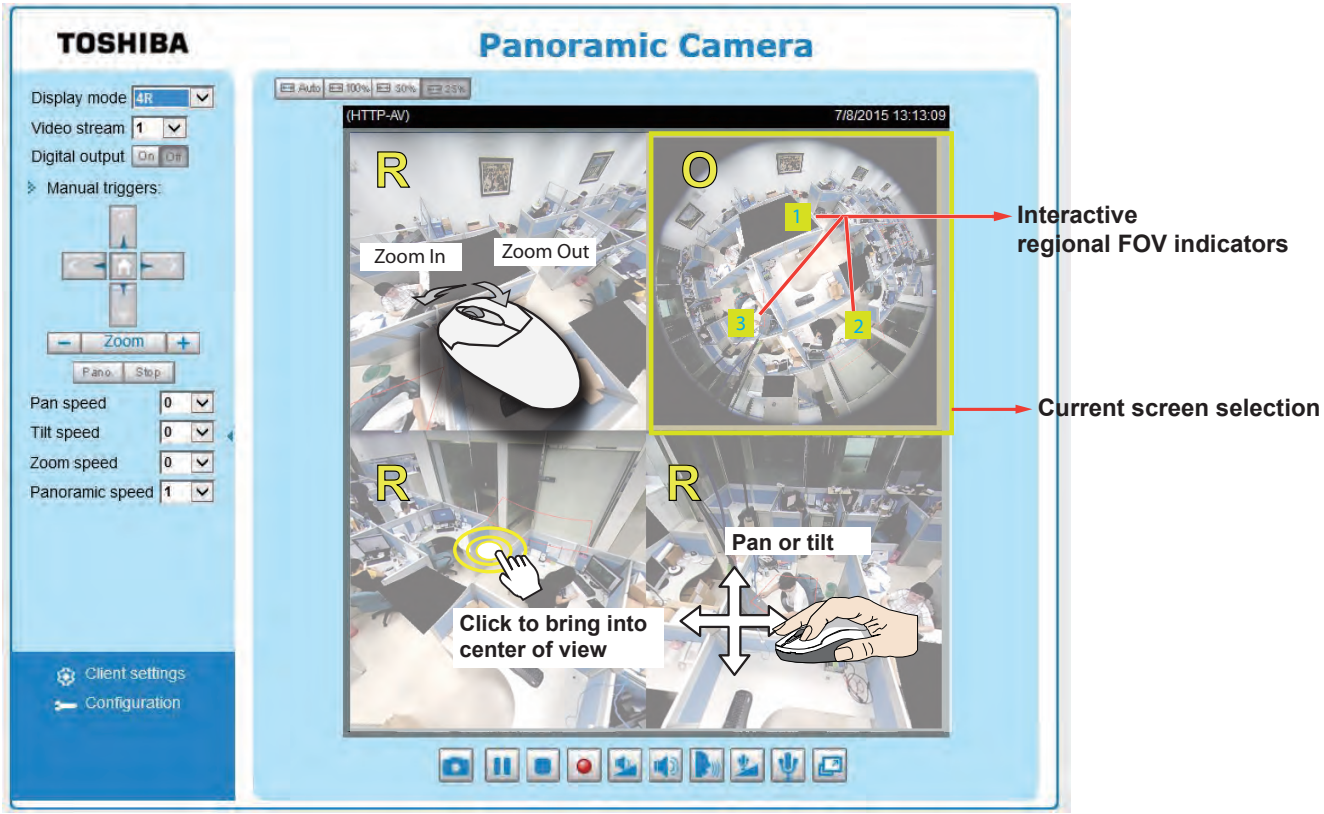
1O3R (One Original & Three Regional) Display mode:

The 1O3R mode provides access to multiple live view sections within the hemisphere and the reference to their relative positions on an Original circular view. The FOV indicators (#1 ~ #3) interact with your current operation as you may zoom in/out or move the live view window to a different place.

You can zoom in or out or travel to other areas within the hemisphere using identical methods as previously described in the 1R mode.

You can also change the locations of Regional views by dragging the FOV indicators on the "Original" circular view.

1O3R (Original & Regional) Mode Screen Control



In a Regional view displaying 100% of video feed (via the Resize buttons - see page 32), your mouse wheel can be used to scroll the view window vertically before you click on a live image. After you click on the live image, the mouse wheel becomes the zoom in/out tool.

4R (Four Regional) Display mode:

The view control and look and feel are identical to that as described in the 1O3R mode except the absence of the Original circular view.

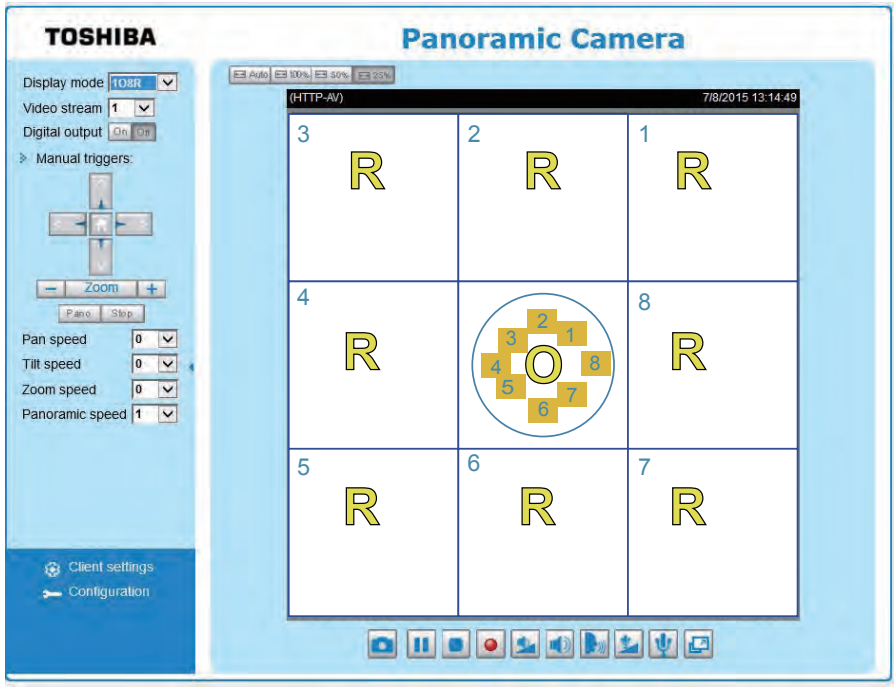
4R PRO (Four Regional Proactive) Display mode:

The 4R PRO mode is similar to the 4R mode except that the quad view windows consecutively rotate in correspondence to the change of view area in one window. Note that zoom in/out and pan/tilt control in camera control area is not available in this mode.

1O8R (One Original and Eight Regional) Display mode:

The view control and look and feel are identical to that as described in the 1O3R mode.

Note that if you change the position of a view in hemisphere, e.g., #3 window, you may lose the configuration change by switching to another display mode. The live view window does not automatically save your view section layout.

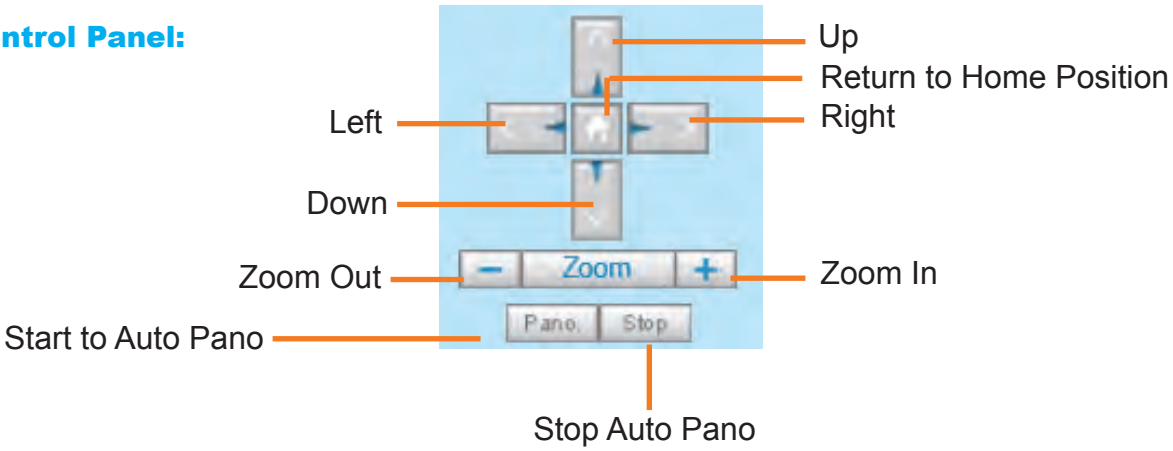


Video Stream: This Network Camera supports multiple streams (stream #1 ~ #3) simultaneously. You can select any one of them for live viewing. For more information about multiple streams, please refer to page 88 for detailed information.

Manual Trigger: Click to manually enable or disable an event trigger. Please configure an event setting before enabling this function. A total of 3 or 4 event settings can be configured. For more information about event setting, please refer to page 95. If you want to hide this item on the homepage, please go to the **System > Homepage Layout > General settings > Customized button** to deselect the "show manual trigger button" checkbox.

Digital Output: Click to turn the digital output device on or off.

PTZ Control Panel:



Pano.: Click this button to start the automated circular rotation through a regional view (360° continuous rotation). Note that this function does not apply in a Panoramic view because a Panoramic view already shows the full coverage.

Stop: Click this button to stop the Auto Pano and Auto Rotate functions.

Pan /Tilt /Zoom /Panoramic/Rotate speed: Adjust the speed of these controls when exerted:

Pan speed	Tilt speed	Zoom speed	Panoramic speed	
-5	-5	-5	-	Slower
-4	-4	-4	-	
-3	-3	-3	-	
-2	-2	-2	-	
-1	-1	-1	-	
0	0	0	-	
1	1	1	1	
2	2	2	2	
3	3	3	3	
4	4	4	4	
5	5	5	5	Faster

Note: All regional display positions and PTZ setup are not store on Home screen, and reset after change of "Display mode" and "Mount type".

Configuration Area

Client Settings: Click this button to access the client setting page. For more information, please refer to Client Settings on page 35.

Configuration: Click this button to access more of the configuration options provided with the Network

Camera. It is suggested that a password is applied to the Network Camera so that only the administrator can configure the Network Camera. For more information, please refer to the description for the Configuration menus on page 37.

Hide Button

You can click the hide button to hide the control panel or display the control panel.

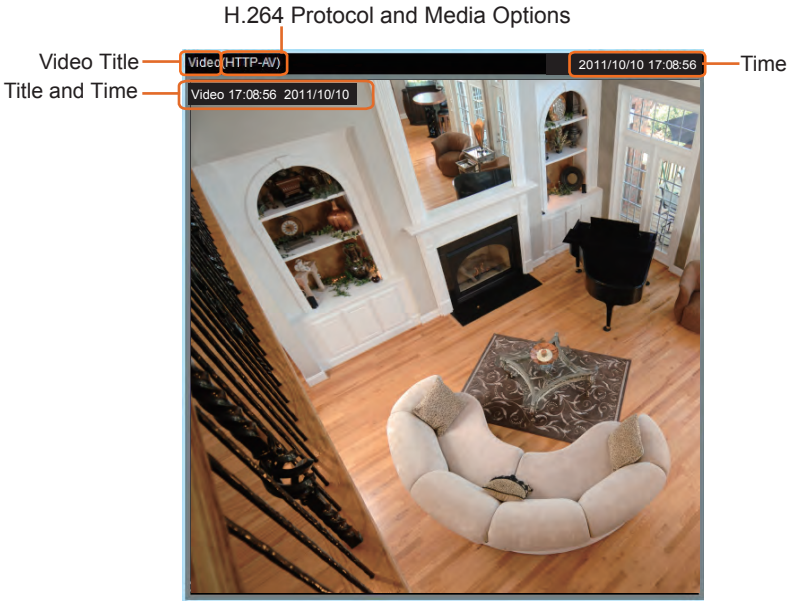
Resize Buttons

:

Click the Auto button, the video cell will resize automatically to fit the monitor.
Click 100% is to display the original homepage size.
Click 50% is to resize the homepage to 50% of its original size.
Click 25% is to resize the homepage to 25% of its original size.

Live Video Window

■ The following window is displayed when the video mode is set to H.264 / MPEG-4:



Video Title: The video title can be configured. For more information, please refer to Video settings on page 76.

H.264 / MPEG-4 Protocol and Media Options: The transmission protocol (TCP or UDP, etc.)and media options for H.264 / MPEG-4 video streaming. For further configuration, please refer to Client Settings on page 35.

Time: Display the current time. For further configuration, please refer to Audio and Video > Image > General settings on page 76.

Title and Time: The video title and time can be stamped on the streaming video. For further configuration, please refer to Audio and Video > Image > General settings on page 76.

Video and Audio Control Buttons: Depending on the Network Camera model and Network Camera configuration, some buttons may not be available.

 Snapshot: Click this button to capture and save still images. The captured images will be displayed in a pop-up window. Right-click the image and choose **Save Picture As** to save it in JPEG (*.jpg) or BMP (*.bmp) format.

 Pause: Pause the transmission of the streaming media. The button becomes the  Resume button after clicking the Pause button.

 Stop: Stop the transmission of the streaming media. Click the  Resume button to continue transmission.

 Start MP4 Recording: Click this button to record video clips in MP4 file format to your computer. Press the  Stop MP4 Recording button to end recording. When you exit the web browser, video recording stops accordingly. To specify the storage destination and file name, please refer to MP4 Saving Options on page 36 for details.

 Volume: When the  Mute function is not activated, move the slider bar to adjust the volume on the local computer.

 Mute: Turn off the volume on the local computer. The button becomes the  Audio On button after clicking the Mute button.

 Talk: Click this button to talk to people around the Network Camera. Audio will project from the external speaker connected to the Network Camera. Click this button  again to end talking transmission.

 Mic Volume: When the  Mute function is not activated, move the slider bar to adjust the microphone volume on the local computer. Note that inernal microphone is mounted on the dome cover.

 Mute: Turn off the  Mic volume on the local computer. The button becomes the  Mic On button after clicking the Mute button.

 Full Screen: Click this button to switch to full screen mode. Press the “Esc” key to switch back to normal mode.

■ The following window is displayed when the video mode is set to MJPEG:

Video Title: The video title can be configured. For more information, please refer to Audio and Video > Image on page 76.

Time: Display the current time. For more information, please refer to Audio and Video > Image on page 76.

Title and Time: Video title and time can be stamped on the streaming video. For more information, please refer to Audio and Video > Image on page 76.

Video Control Buttons: Depending on the camera model and your current configuration, some buttons may not be available.

Snapshot: Click this button to capture and save still images. The captured images will be displayed in a pop-up window. Right-click the image and choose **Save Picture As** to save it in JPEG (*.jpg) or BMP (*.bmp) format.

Start MP4 Recording: Click this button to record video clips in MP4 file format to your computer. Press the Stop MP4 Recording button to end recording. When you exit the web browser, video recording stops accordingly. To specify the storage destination and file name, please refer to MP4 Saving Options on page 36 for details.

Full Screen: Click this button to switch to full screen mode. Press the “Esc” key to switch back to normal mode.

Client Settings

This chapter explains how to select the stream transmission mode and saving options on the local computer. When completed with the settings on this page, click **Save** on the page bottom to enable the settings.

H.264 / MPEG-4 Media Options

Select to stream video or audio data or both. This is enabled only when the video mode is set to H.264 or MPEG-4..

H.264 / MPEG-4 Protocol Options

Depending on your network environment, there are four options with the transmission protocols with H.264 or MPEG-4 streaming:

UDP unicast: This protocol allows for more real-time audio and video streams. However, network packets may be lost due to network burst traffic and images may be broken. Activate UDP connection when occasions require time-sensitive responses and the video quality is less important. Note that each unicast client connecting to the server takes up additional bandwidth and the Network Camera allows up to ten simultaneous accesses.

UDP multicast: This protocol allows multicast-enabled routers to forward network packets to all clients requesting streaming media. This helps to reduce the network transmission load of the Network Camera while serving multiple clients at the same time. Note that to utilize this feature, the Network Camera must be configured to enable multicast streaming at the same time. For more information, please refer to RTSP Streaming on page 69.

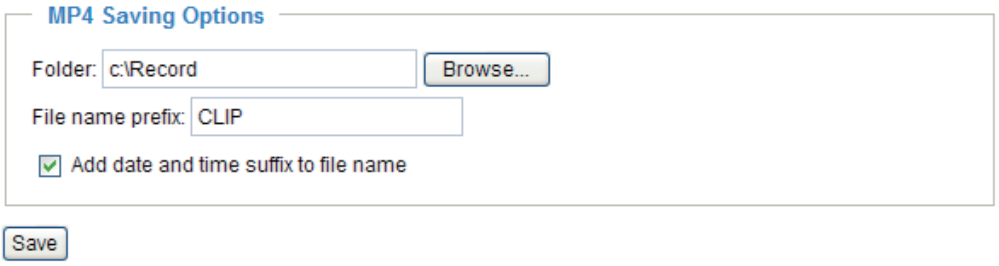
TCP: This protocol guarantees the complete delivery of streaming data and thus provides better video quality. The downside of this protocol is that its real-time effect is not as good as that of using the UDP protocol.

HTTP: This protocol allows the same quality as TCP protocol without needing to open specific ports for streaming under some network environments. Users behind a firewall can utilize this protocol to allow camera's streaming data to pass through.

Two way audio

The half and Full-duplex modes determine the operation mode between the camera and the operator. In Full-duplex mode, the client PC must have an audio codec capable of full-duplex functionality.

MP4 Saving Options

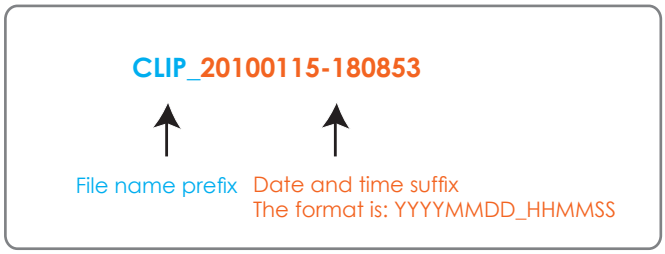


Users can record live video as they are watching it by clicking  Start MP4 Recording on the main page. Here, you can specify the storage destination and file name.

Folder: Specify a storage destination for the recorded video files.

File name prefix: Enter the text that will be appended to the front of the video file name.

Add date and time suffix to the file name: Select this option to append the date and time to the end of the file name.



Local Streaming Buffer Time

Due to unsteady bandwidth flow, live streaming may lag. If you enable this option, the live streaming will be cached on the camera's buffer memory before being played on the live viewing window. This helps produce smoother live streaming. If you enter a value of 3000 milliseconds, the streaming will delay for 3 seconds.

Configuration

Click **Configuration** on the main page to enter the camera setting pages. Note that only Administrators can access the configuration page.

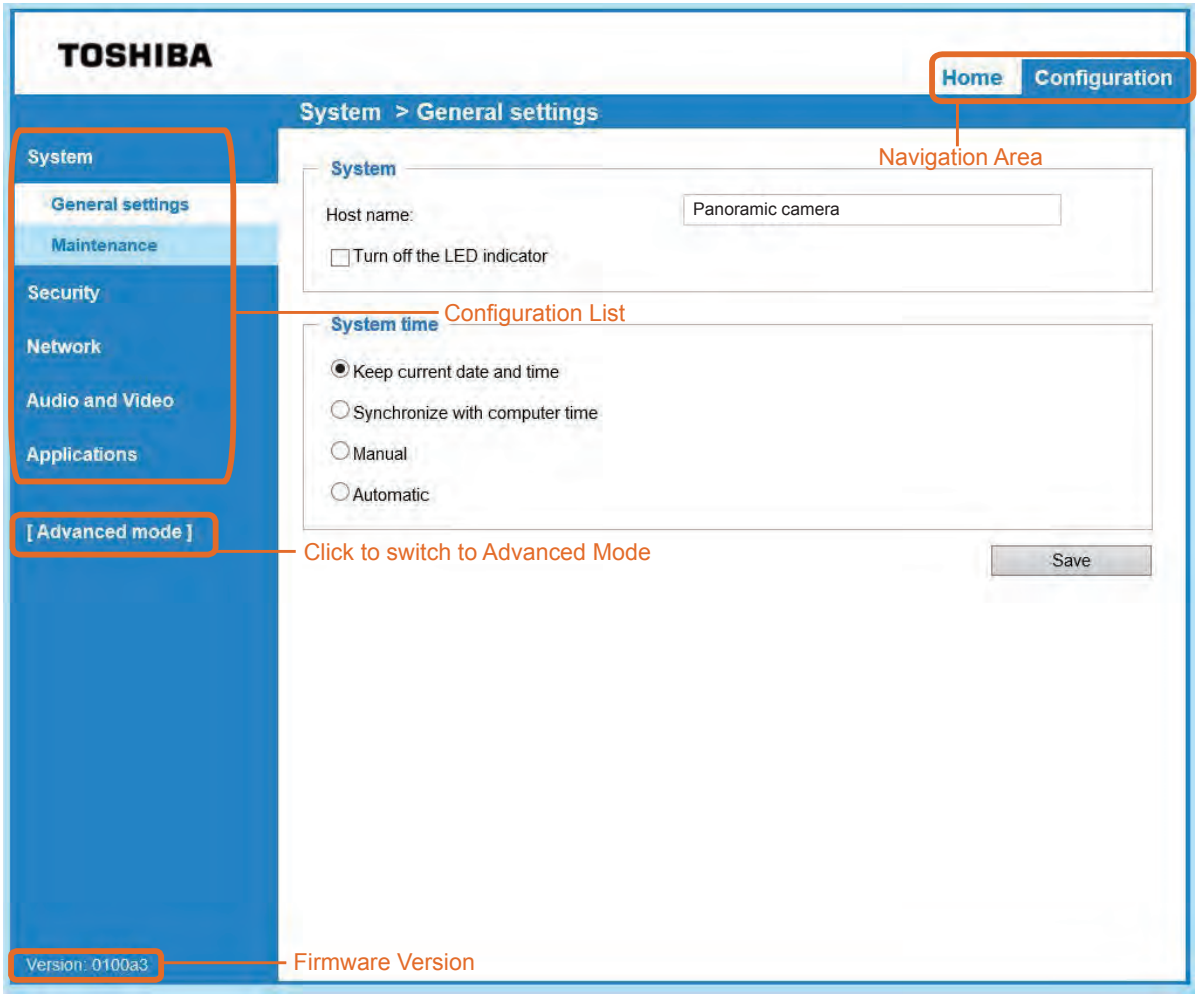
TOSHIBA offers an easy-to-use user interface that helps you set up your network camera with minimal effort. To simplify the setting procedure, two types of user interfaces are available: Advanced Mode for professional users and Basic Mode for entry-level users. Some advanced functions (PTZ/ Event/ Recording/ Local storage) are not displayed in Basic Mode.

If you want to set up advanced functions, please click on **[Advanced Mode]** at the bottom of the configuration list to switch to Advanced Mode.

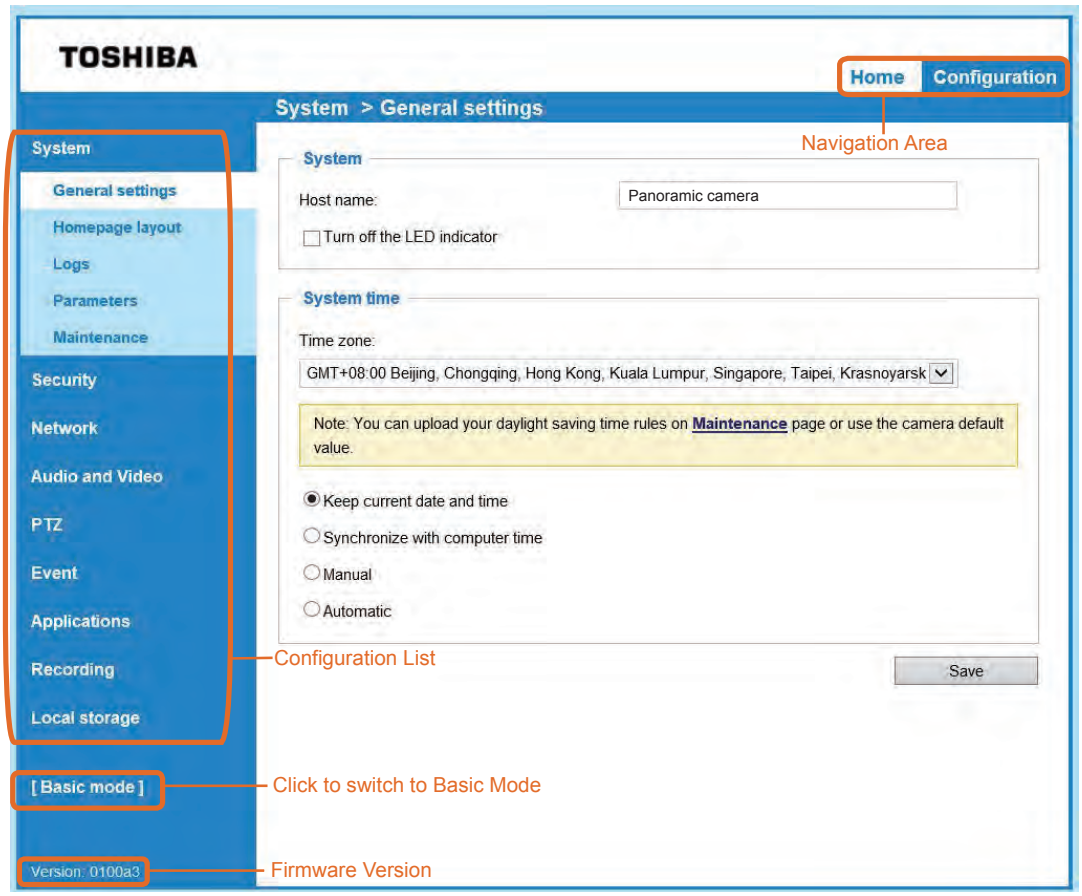
In order to simplify the user interface, detailed information will be hidden unless you click on the function item. When you click on the first sub-item, the detailed information for the first sub-item will be displayed; when you click on the second sub-item, the detailed information for the second sub-item will be displayed and that of the first sub-item will be hidden.

The following is the interface of the Basic Mode and the Advanced Mode:

Basic Mode



Advanced Mode



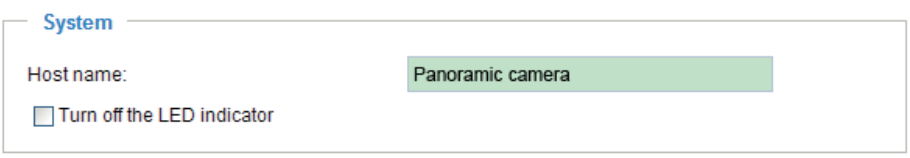
Each function on the configuration list will be explained in the following sections. Those functions that are displayed only in Advanced Mode are marked with Advanced Mode. If you want to set up advanced functions, please click on **[Advanced Mode]** at the bottom of the configuration list.

The Navigation Area provides access to all different views from the **Home** page (for live viewing) and **Configuration** page.

System > General settings

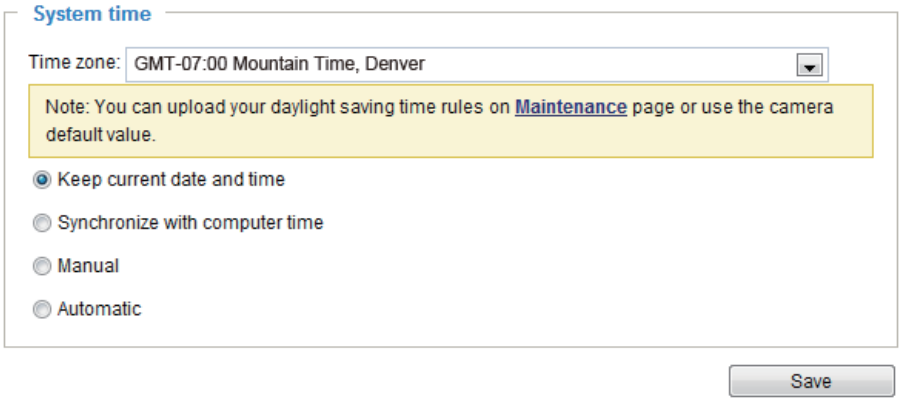
This section explains how to configure the basic settings for the Network Camera, such as the host name and system time. It is composed of the following two columns: System and System Time.

System



Host name: Enter a desired name for the Network Camera. The name will be displayed at the top center of the main page.
Turn off the LED indicator : To disable the status LED light, uncheck this option.

System time



Keep current date and time: Select this option to preserve the current date and time of the Network Camera. The Network Camera's internal real-time clock maintains the date and time even when the power of the system is turned off.

Synchronize with computer time: Select this option to synchronize the date and time of the Network Camera with the local computer. The read-only date and time of the PC is displayed as updated.

Manual: The administrator can enter the date and time manually. Note that the date and time format are [yyyy/mm/dd] and [hh:mm:ss].

Automatic: The Network Time Protocol is a protocol which synchronizes computer clocks by periodically querying an NTP Server.

NTP server: Assign the IP address or domain name of the time-server. Leaving the text box blank connects the Network Camera to the default time servers.

Update interval: Select to update the time using the NTP server on an hourly, daily, weekly, or monthly basis.

Time zone Advanced Mode: Select the appropriate time zone from the list. If you want to upload Daylight Savings Time rules, please refer to **System > Maintenance > Import/ Export files** on page 46 for details.

When finished with the settings on this page, click **Save** at the bottom of the page to enable the settings.

System > Homepage layout Advanced Mode

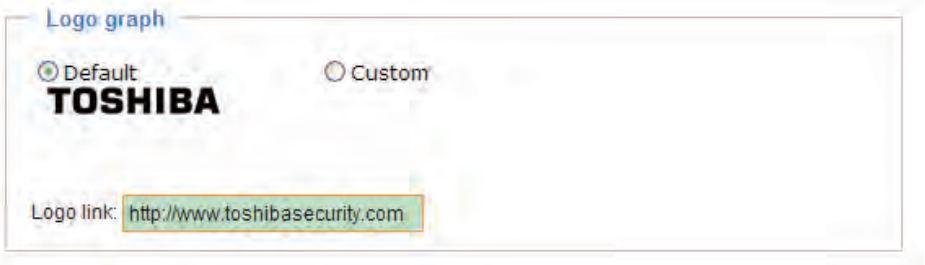
This section explains how to set up your own customized homepage layout.

General settings

This column shows the settings of your hompage layout. You can manually select the background and font colors in Theme Options (the second tab on this page). The settings will be displayed automatically in this Preview field. The following shows the homepage using the default settings:

Logo graph

Here you can change the logo at the top of your homepage.



Follow the steps below to upload a new logo:
1. Click **Custom** and the Browse field will appear.
2. Select a logo from your files.
3. Click **Upload** to replace the existing logo with a new one.
4. Enter a website link if necessary.
5. Click **Save** to enable the settings.

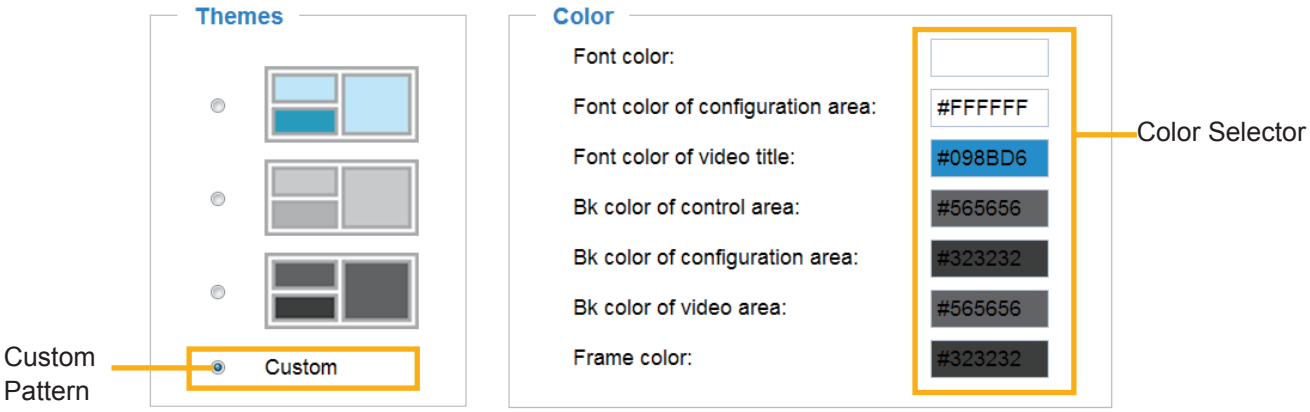
Customized button

If you want to hide manual trigger buttons on the homepage, please uncheck this item. This item is checked by default.

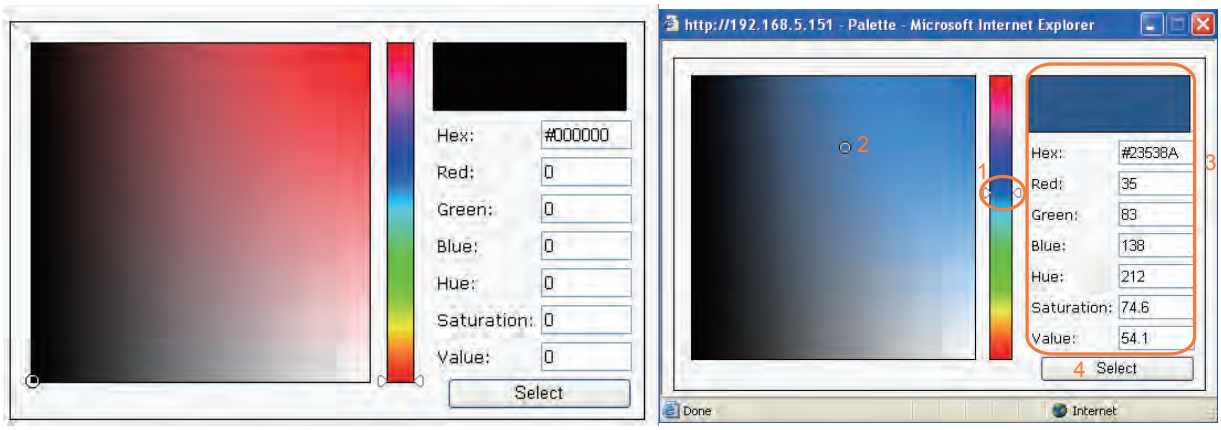
Theme Options

Here you can change the color of your homepage layout. There are three types of preset patterns for you to choose from. The new layout will simultaneously appear in the **Preview** filed. Click **Save** to enable the settings.

■ Follow the steps below to set up a custom homepage:
1. Click **Custom** on the left column.
2. Click to select a color on on the right column.



3. The palette window will pop up as shown below.

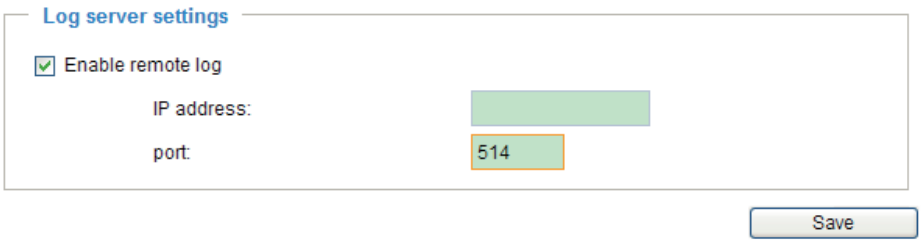


4. Drag the slider bar and click on the left square to select a desired color.
5. The selected color will be displayed in the corresponding fields and in the **Preview** column.
6. Click **Save** to enable the settings.

System > Logs Advanced Mode

This section explains how to configure the Network Camera to backup the system log to a remote server.

Log server settings



Follow the steps below to set up the remote log:

1. Select **Enable remote log**.
2. In the IP address text box, enter the IP address of the remote server.
2. In the port text box, enter the port number of the remote server.
3. When completed, click **Save** to enable the setting.

You can configure the Network Camera to send the system log file to a remote server as a log message. When using this feature, the appropriate syslog server is required for receiving the system log message from the Network Camera.

System log

This column displays the system log in chronological order. The system log is stored in the Network Camera's buffer and dated events will be overwritten when the number of events reaches a limit.

The system log messages stored in the Network Camera will be all cleared after reboot or power down the Network Camera.

Access log

Access log displays the access time and IP address of all viewers (including operators and administrators) in chronological order. The access log is stored in the Network Camera's buffer and older events will be overwritten when the number of events reaches a limit.

The access log messages stored in the Network Camera will be all cleared after reboot or power down the Network Camera.

System > Parameters Advanced Mode

The View Parameters page lists the entire system's parameters in an alphabetical order. If you need technical assistance, please provide the information listed on this page.

System > Maintenance

This chapter explains how to restore the Network Camera to factory default, upgrade firmware version, etc.

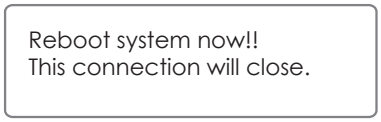
General settings > Upgrade firmware

This feature allows you to upgrade the firmware of your Network Camera. It takes a few minutes to complete the process.
Note: Do not power off the Network Camera during the upgrade!

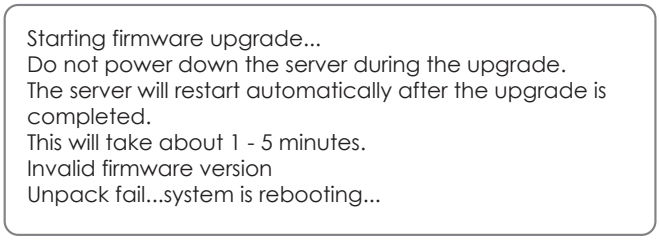
Follow the steps below to upgrade the firmware:
1. Download the latest firmware file from the TOSHIBA website. The file is in .pkg file format.
2. Click **Browse…** and specify the firmware file.
3. Click **Upgrade**. The Network Camera starts to upgrade and will reboot automatically when the upgrade completes.

If the upgrade is successful, you will see “Reboot system now!! This connection will close”. After that, re-access the Network Camera.

The following message is displayed when the upgrade has succeeded.

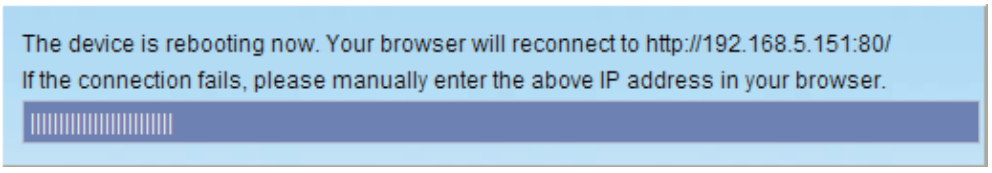


The following message is displayed when you have selected an incorrect firmware file.



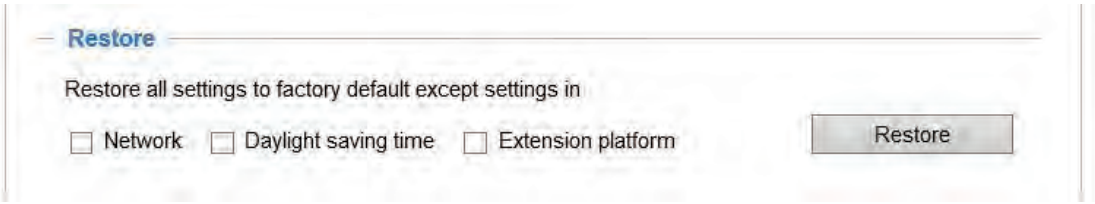
General settings > Reboot

This feature allows you to reboot the Network Camera, which takes about one minute to complete. When completed, the live video page will be displayed in your browser. The following message will be displayed during the reboot process.



If the connection fails after rebooting, manually enter the IP address of the Network Camera in the address field to resume the connection.

General settings > Restore

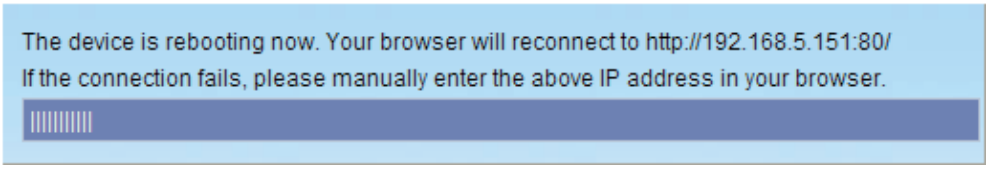


This feature allows you to restore the Network Camera to factory default settings.

Network: Select this option to retain the Network Type settings (please refer to Network Type on page 60).

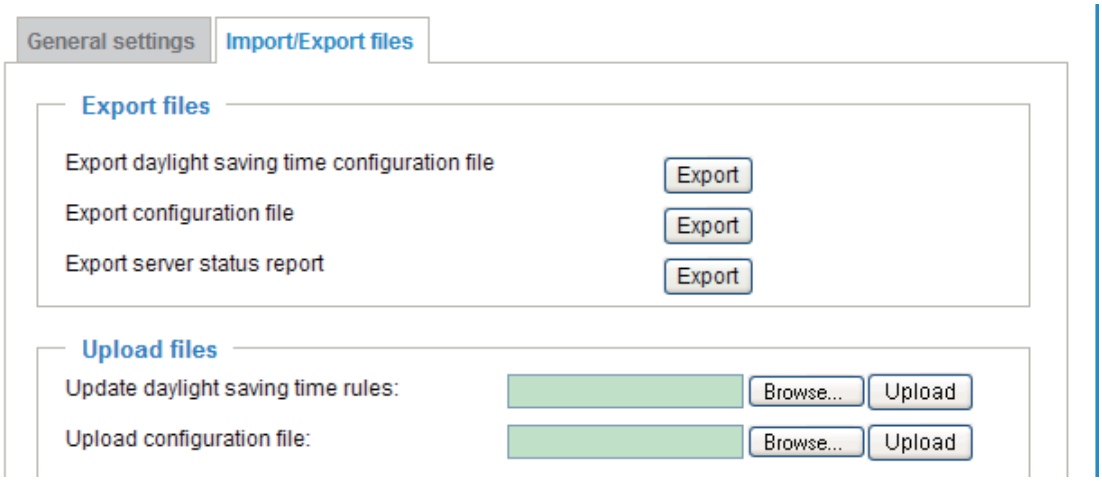
Daylight Saving Time: Select this option to retain the Daylight Saving Time settings (please refer to Import/Export files below on this page).

If none of the options is selected, all settings will be restored to factory default. The following message is displayed during the restoring process.



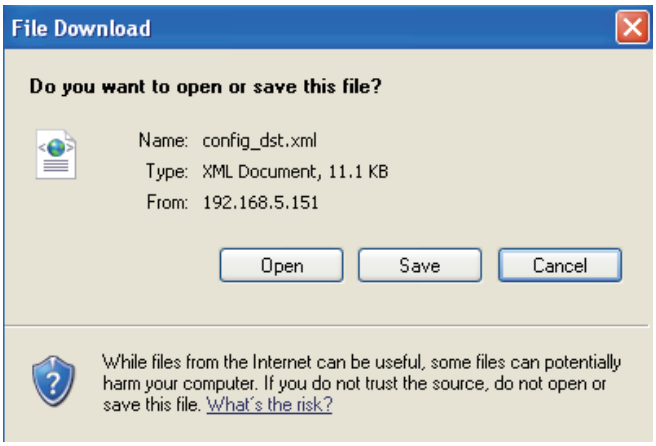
Import/Export files Advanced Mode

This feature allows you to Export / Update daylight saving time rules, custom language file, and configuration file.



Export daylight saving time configuration file: Click to set the start and end time of DST.

Follow the steps below to export:
1. In the Export files column, click **Export** to export the daylight saving time configuration file from the Network Camera.
2. A file download dialog will pop up as shown below. Click **Open** to review the XML file or click **Save** to store the file for editing.

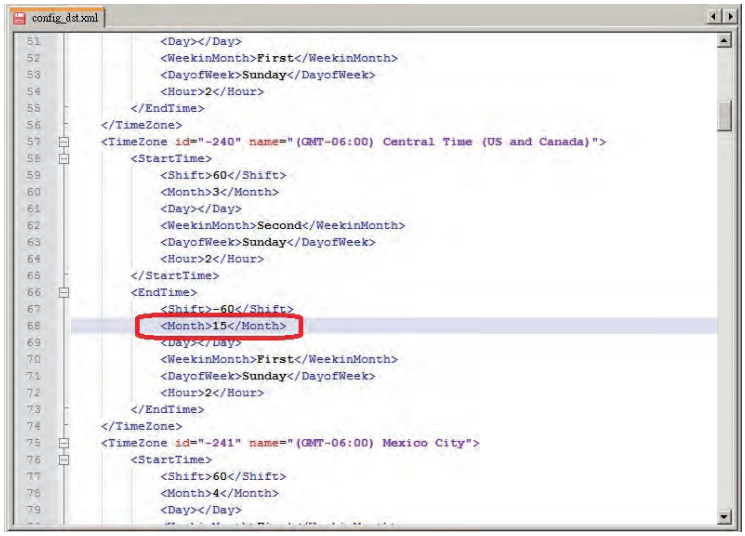


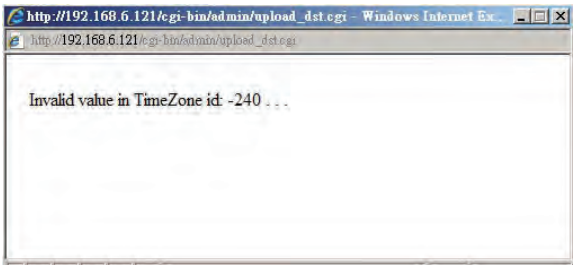
3. Open the file with text editor and locate your time zone; set the start and end time of DST. When completed, save the file.

   In the example below, DST begins each year at 2:00 a.m. on the second Sunday in March and ends at 2:00 a.m. on the first Sunday in November.

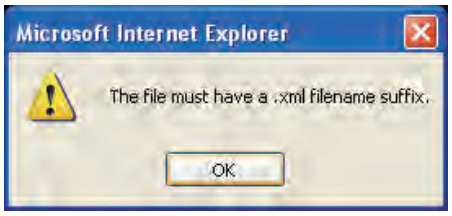
Update daylight saving time rules: Click **Browse…** and specify the XML file to update.

If incorrect date and time are assigned, you will see the following warning message when uploading the file to the Network Camera.





The following message is displayed when attempting to upload an incorrect file format.



Export configuration file: Click to export all parameters for the device and user-defined scripts.

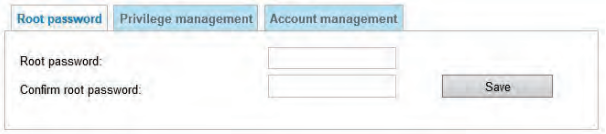
Update configuration file: Click **Browse…** to update a configuration file. Please note that the model and firmware version of the device should be the same as the configuration file. If you have set up a fixed IP or other special settings for your device, it is not suggested to update a configuration file.

Export server staus report: Click to export the current server status report, such as time, logs, parameters, process status, memory status, file system status, network status, kernel message..., and so on.

Security > User Account

This section explains how to enable password protection and create multiple accounts.

Root Password



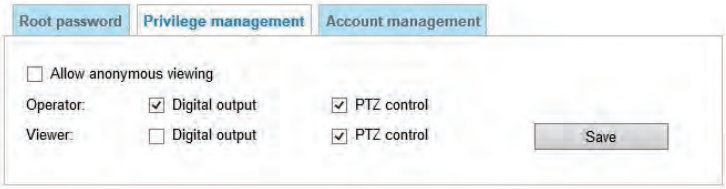
The administrator account name is “root”, which is permanent and can not be deleted. If you want to add more accounts in the Manage User column, please apply the password for the “root” account first.

1. Type the password identically in both text boxes, then click **Save** to enable password protection.
2. A window will prompt for authentication; type the correct user’s name and password in their respective fields to access the Network Camera.

Note:
* Leaving the root password field empty means the camera will not be protected by password.

Privilege management

Advanced Mode

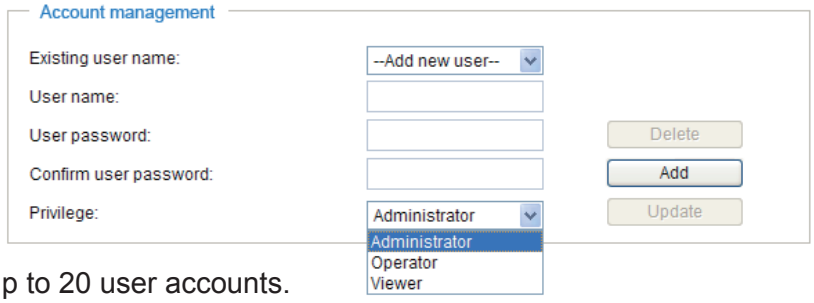


Digital Output & PTZ control: You can modify the management privilege as operators or viewers. Select or de-select the checkboxes, and then click **Save** to enable the settings. If you give Viewers the privilege, Operators will also have the ability to control the Network Camera through the main page. (Please refer to Configuration on page 31).

Allow anonymous viewing: If you check this item, 3GPP clients can access the live stream without entering a User ID and Password.

Note:
* Select RTSP Streaming Authentication to disable.
* This function will not work with Internet Explorer.

Account management



Administrators can create up to 20 user accounts.

1. Input the new user’s name and password.
2. Select the privilege level for the new user account. Click **Add** to enable the setting.

Access rights are sorted by user privilege (Administrator, Operator, and Viewer). Only administrators can access the Configuration page. Though operators cannot access the Configuration page, they can use the URL Commands to get and set the value of parameters. For more information, please refer to URL Command Guide. Viewers access only the main page for live viewing.

Here you also can change a user’s access rights or delete user accounts.

1. Select an existing account to modify.
2. Make necessary changes and click **Update** or **Delete** to enable the setting.

Security > HTTPS (Hypertext Transfer Protocol over SSL)

Advanced Mode

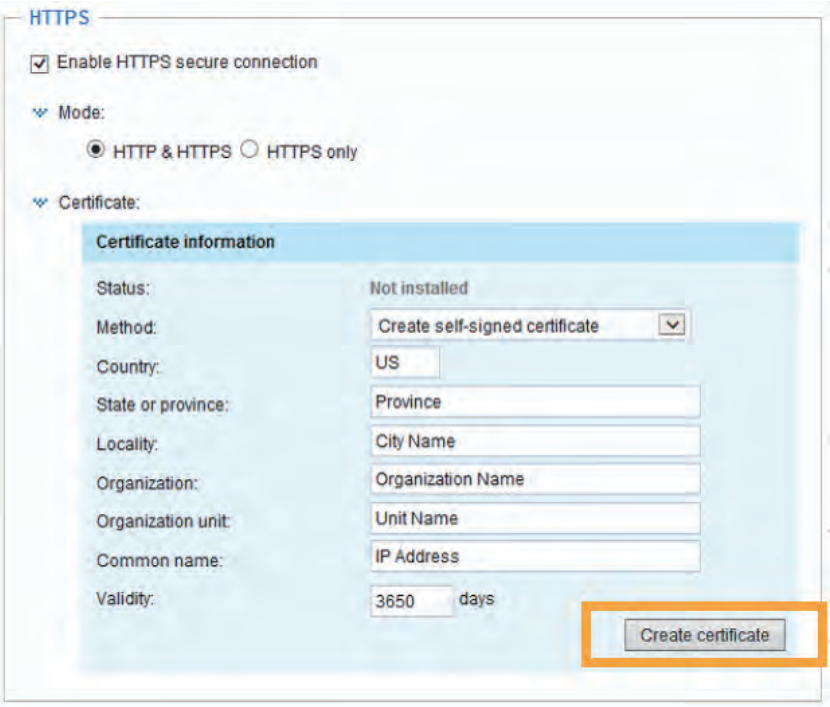
This section explains how to enable authentication and encrypted communication over SSL (Secure Socket Layer). It helps protect streaming data transmission over the Internet on higher security level.

Create and Install Certificate Method

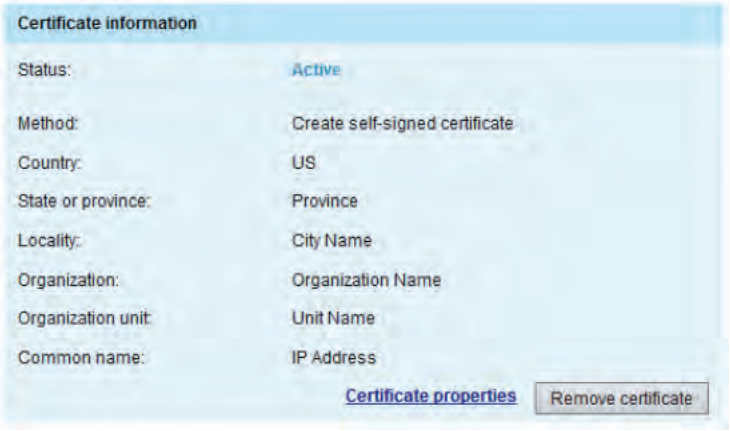
Before using HTTPS for communication with the Network Camera, a **Certificate** must be created first. There are two ways to create and install a certificate:

Create self-signed certificate

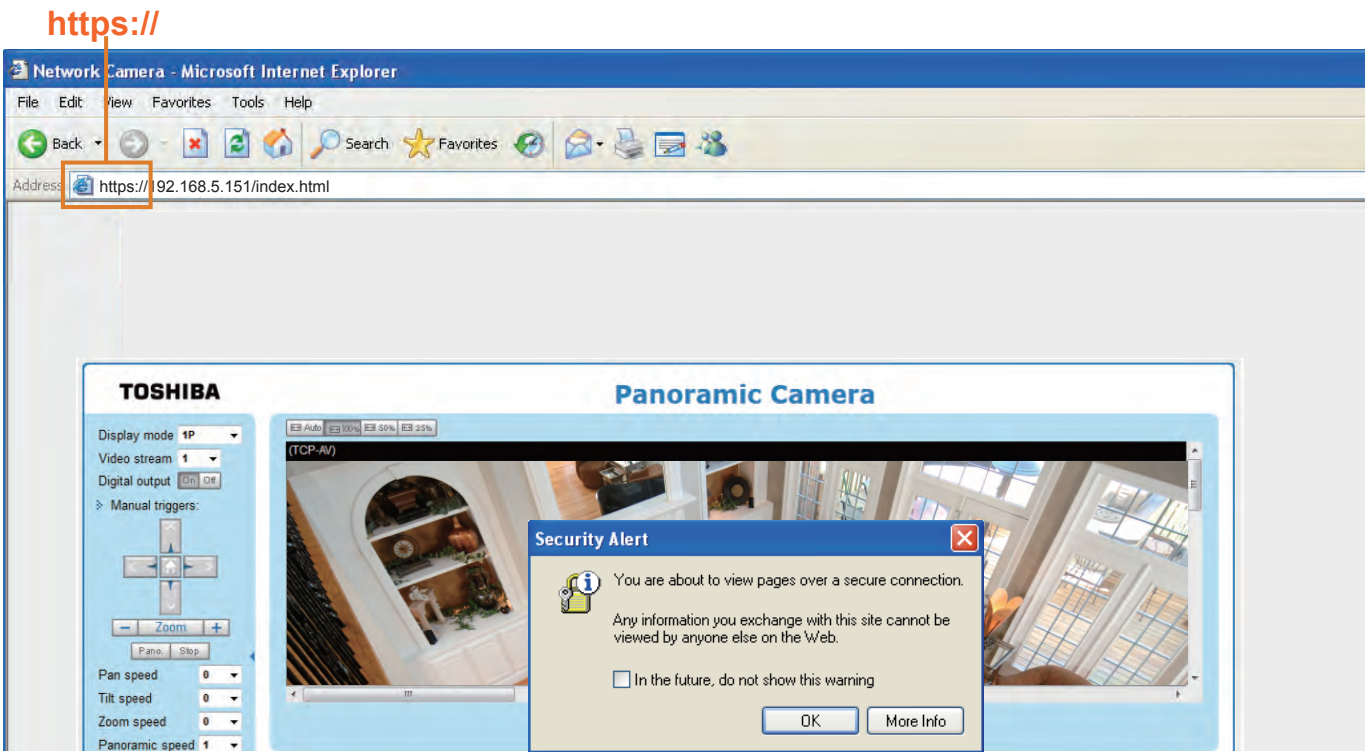
1.Select this option from a pull-down menu.
2. In the first column, select **Enable HTTPS secure connection**, then select a connection option: “HTTP & HTTPS” or “HTTPS only”.
3.Click **Create certificate** to generate a certificate.

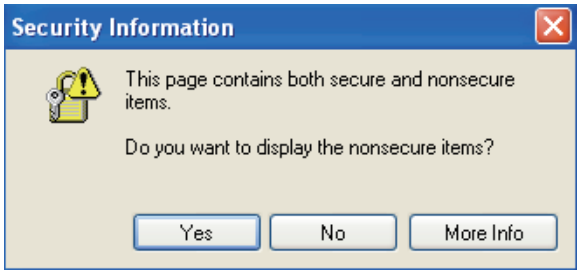


4. The Certificate Information will automatically be displayed as shown below. You can click **Certificate properties** to view detailed information about the certificate.



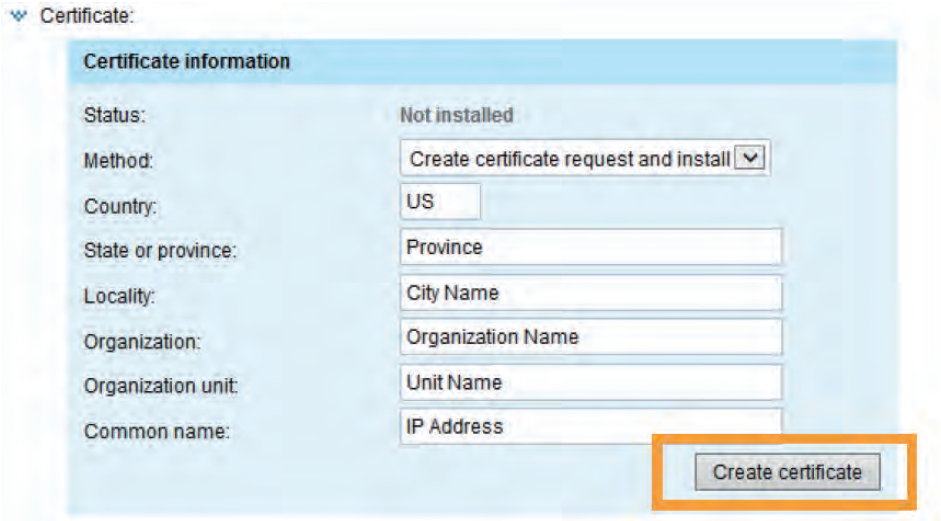
5. Click **Home** to return to the main page. Change the address from "http://" to "https://" in the address bar and press **Enter** on your keyboard. Some Security Alert dialogs will pop up. Click **OK** or **Yes** to enable HTTPS.



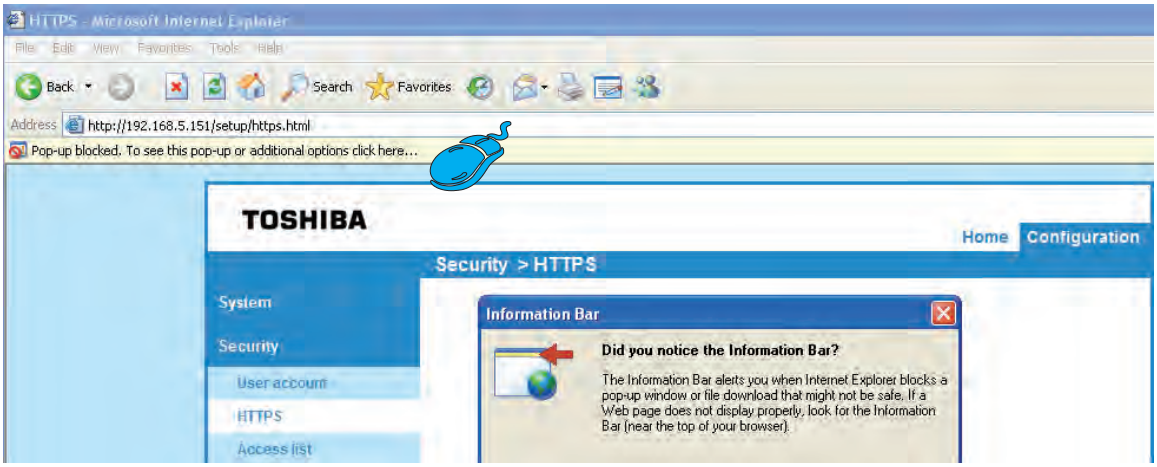


Create certificate request and install : Select this option if you want to create a certificate from a certificate authority.

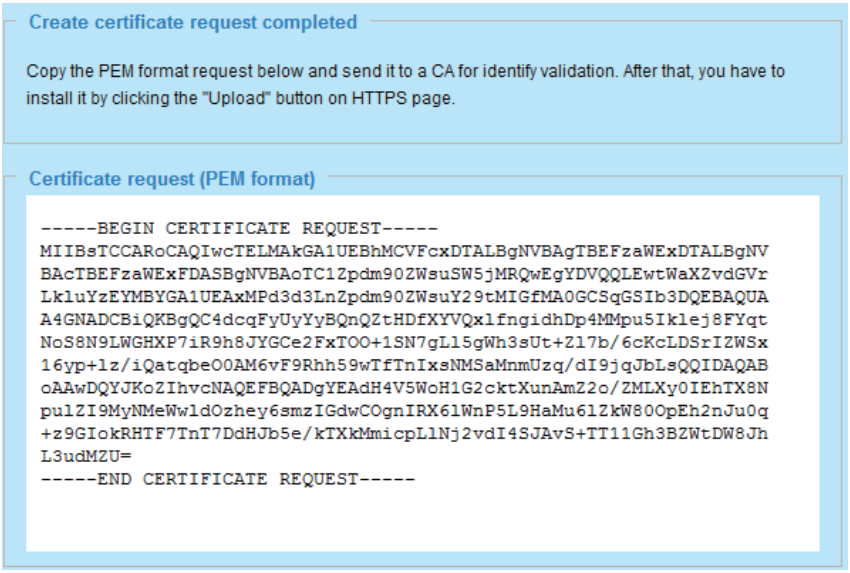
1. Select this option from a method pull-down menu.
2. Click **Create certificate** to generate the certificate.



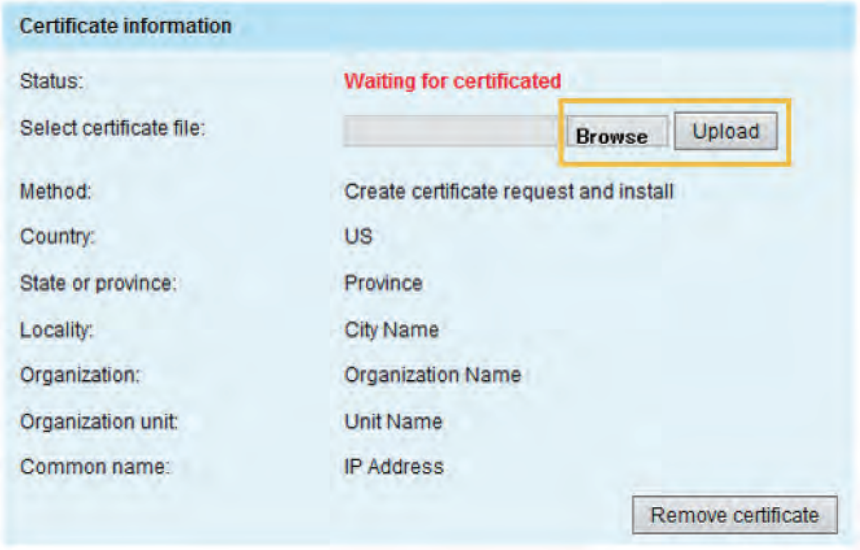
3. If you see the following Information bar, click **OK** and click on the Information bar at the top of the page to allow pop-ups.



4. The pop-up window shows an example of a certificate request.



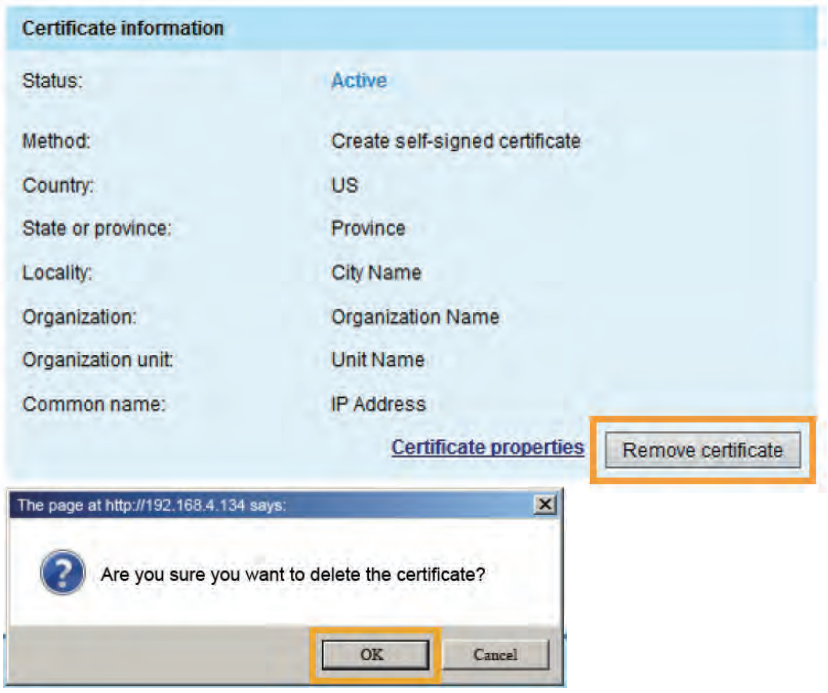
5. Look for a trusted certificate authority that issues digital certificates. Enroll the Network Camera. Wait for the certificate authority to issue a SSL certificate; click **Browse...** to search for the issued certificate, then click **Upload** in the column.



NOTE

● 1. How do I cancel the HTTPS settings?

1-1. Click on the **Remove certificate** button.

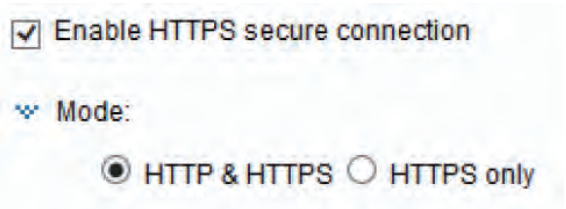


1-2. The webpage will redirect to a non-HTTPS page automatically.

● 2. If you want to create and install other certificates, please remove the existing one.

Enable HTTPS

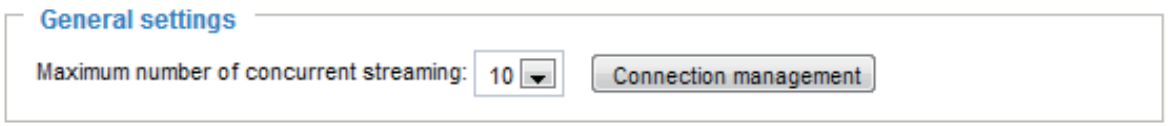
Check this item to enable HTTPS communication, then select a connection option: ”HTTP & HTTPS” or “HTTPS only”. Note that you have to create and install a certificate first before clicking the Save button.



Security > Access List

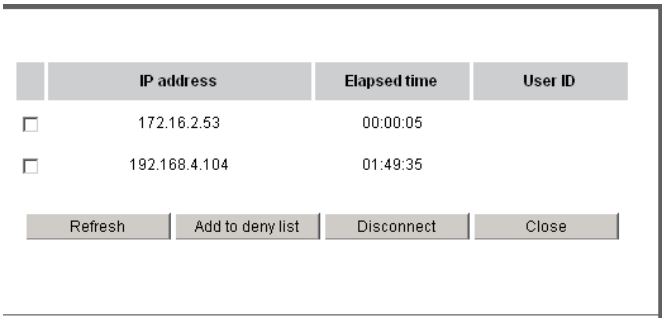
This section explains how to control access permission by verifying the client PC's IP address.

General Settings



Maximum number of concurrent streaming: Simultaneous live viewing for 1~10 clients (including stream 1 to stream 3). The default value is 10. If you modify the value and click **Save**, all current connections will be disconnected and automatically attempt to re-link.

Connection management: Click this button to display the connection status window showing a list of the current connections. For example:



Note that only consoles that are currently displaying live streaming will be listed in the Connection management list.

■ IP address: Current connections to the Network Camera.

■ Elapsed time: How much time the client has been at the webpage.

■ User ID: If the administrator has set a password for the webpage, the clients have to enter a user name and password to access the live video. The user name will be displayed in the User ID column. If the administrator allows clients to link to the webpage without a user name and password, the User ID column will be empty.

There are some situations that allow clients access to the live video without a user name and password:

1. The administrator does not set up a root password. For more information about how to set up a root password and manage user accounts, please refer to Security > User account on page 49.
2. The administrator has set up a root password, but set **RTSP Authentication** to "disable". For more information about **RTSP Authentication**, please refer to RTSP Streaming on page 69.
3. The administrator has set up a root password, but allows anonymous viewing. For more information about **Allow Anonymous Viewing,** please refer to page 49.

■ Refresh: Click this button to refresh all current connections.

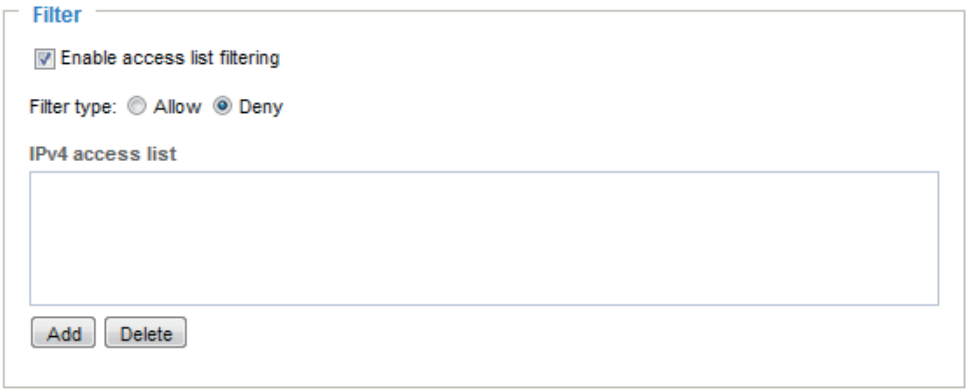
■ Add to deny list: You can select entries from the Connection Status list and add them to the Deny List to deny access. Please note that those checked connections will only be disconnected temporarily and will automatically try to re-link again (IE Explore or Quick Time Player). If you want to enable the denied list, please check **Enable access list filtering** and click **Save** in the first column.

■ Disconnect: If you want to break off the current connections, please select them and click this button. Please note that those checked connections will only be disconnected temporarily and will automatically try to re-link again (IE Explore or Quick Time Player).

Filter

Enable access list filtering: Check this item and click **Save** if you want to enable the access list filtering function.

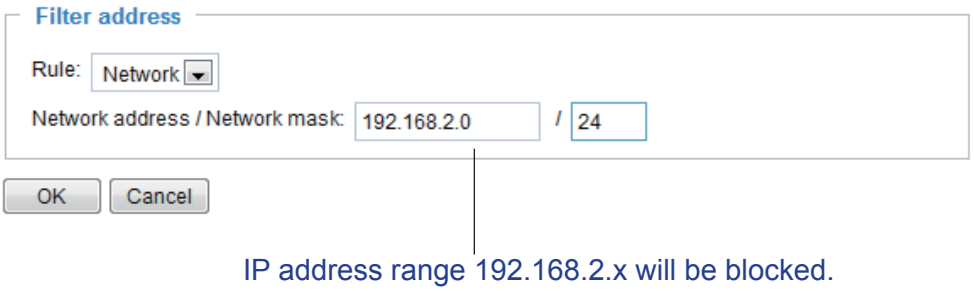
Filter type: Select **Allow** or **Deny** as the filter type. If you choose **Allow Type**, only those clients whose IP addresses are on the Access List below can access the Network Camera, and the others cannot. On the contrary, if you choose **Deny Type**, those clients whose IP addresses are on the Access List below will not be allowed to access the Network Camera, and the others access.



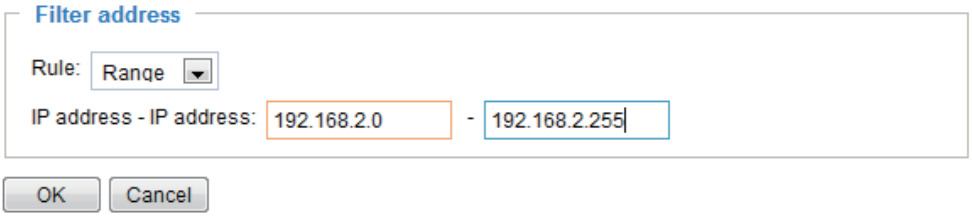
Then you can **Add** a rule to the following Access List. Please note that the IPv6 access list column will not be displayed unless you enable IPv6 on the Network page. For more information about **IPv6 Settings**, please refer to Network > General settings on page 64 for detailed information.

There are three types of rules:
Single: This rule allows the user to add an IP address to the Allowed/Denied list.
For example:

Network: This rule allows the user to assign a network address and corresponding subnet mask to the Allow/Deny List. The address and network mask are written in CIDR format.
For example:

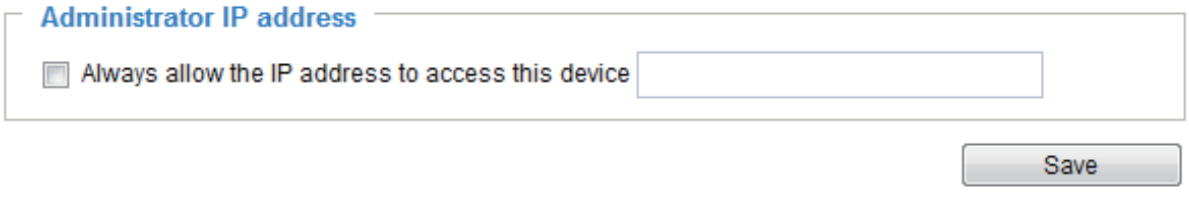


Range: This rule allows the user to assign a range of IP addresses to the Allow/Deny List.
Note: This rule only applies to IPv4 addresses.
For example:



Administrator IP address

Always allow the IP address to access this device: You can check this item and add the Administrator's IP address in this field to make sure the Administrator can always connect to the device.



Security > IEEE 802.1x Advanced Mode

Enable this function if your network environment uses IEEE 802.1x, which is a port-based network access control. The network devices, intermediary switch/access point/hub, and RADIUS server must support and enable 802.1x settings.

The 802.1x standard is designed to enhance the security of local area networks, which provides authentication to network devices (clients) attached to a network port (wired or wireless). If all certificates between client and server are verified, a point-to-point connection will be enabled; if authentication fails, access on that port will be prohibited. 802.1x utilizes an existing protocol, the Extensible Authentication Protocol (EAP), to facilitate communication.

■ The components of a protected network with 802.1x authentication:

Supplicant
(Network Camera)

Authenticator
(Network Switch)

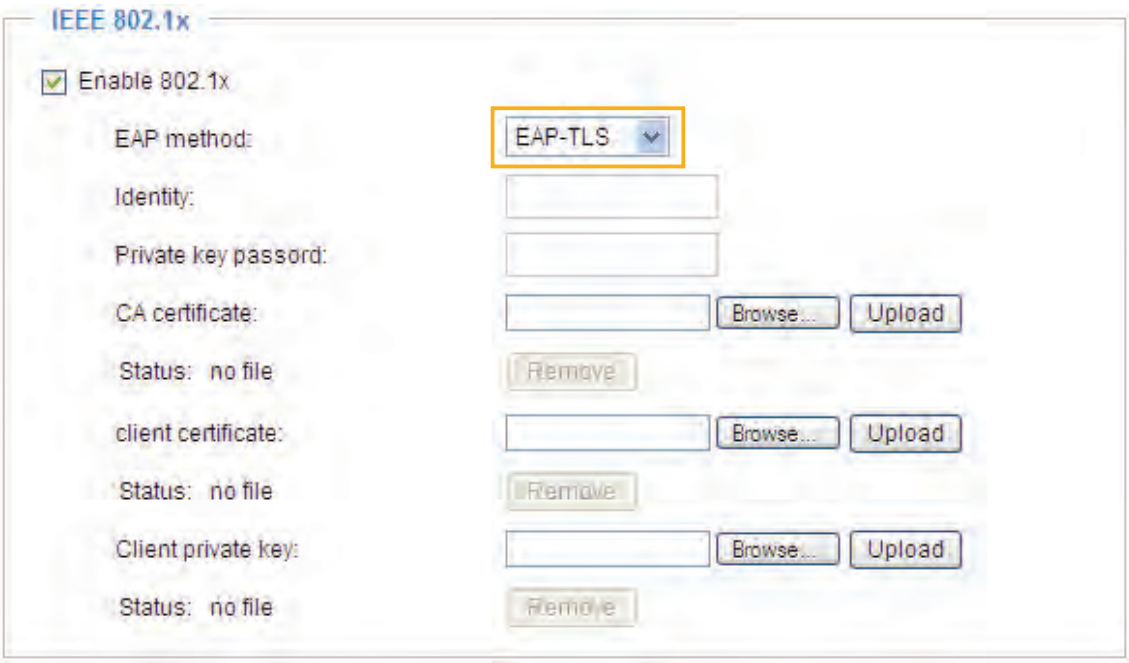
Authentication Server
(RADIUS Server)

1. Supplicant: A client end user (camera), which requests authentication.
2. Authenticator (an access point or a switch): A “go between” which restricts unauthorized end users from communicating with the authentication server.
3. Authentication server (usually a RADIUS server): Checks the client certificate and decides whether to accept the end user’s access request.

■ Network Cameras support two types of EAP methods to perform authentication: **EAP-PEAP** and **EAP-TLS**.

Please follow the steps below to enable 802.1x settings:

1. Before connecting the Network Camera to the protected network with 802.1x, please apply a digital certificate from a Certificate Authority (ie. MIS of your company) which can be validated by a RADIUS server.
2. Connect the Network Camera to a PC or notebook outside of the protected LAN. Open the configuration page of the Network Camera as shown below. Select **EAP-PEAP** or **EAP-TLS** as the EAP method. In the following blanks, enter your ID and password issued by the CA, then upload related certificate(s).

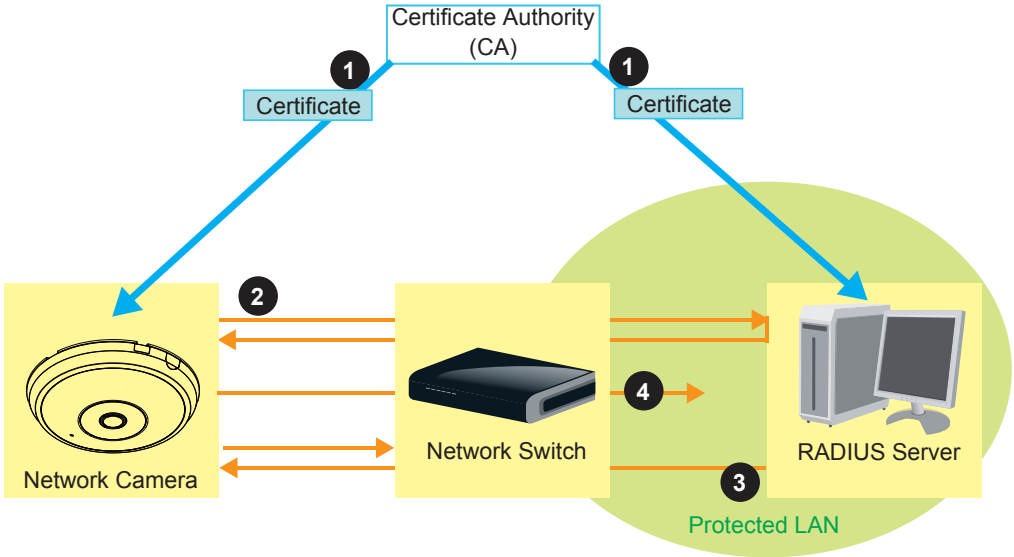


3. When all settings are complete, move the Network Camera to the protected LAN by connecting it to an 802.1x enabled switch. The devices will then start the authentication automatically.

NOTE

- The maximum length of password is 200 symbols.
- The authentication process for 802.1x:

1. The Certificate Authority (CA) provides the required signed certificates to the Network Camera (the supplicant) and the RADIUS Server (the authentication server).
2. A Network Camera requests access to the protected LAN using 802.1X via a switch (the authenticator). The client offers its identity and client certificate, which is then forwarded by the switch to the RADIUS Server, which uses an algorithm to authenticate the Network Camera and returns an acceptance or rejection back to the switch.
3. The switch also forwards the RADIUS Server's certificate to the Network Camera.
4. Assuming all certificates are validated, the switch then changes the Network Camera's state to authorized and is allowed access to the protected network via a pre-configured port.



Network > General settings

This section explains how to configure a wired network connection for the Network Camera.

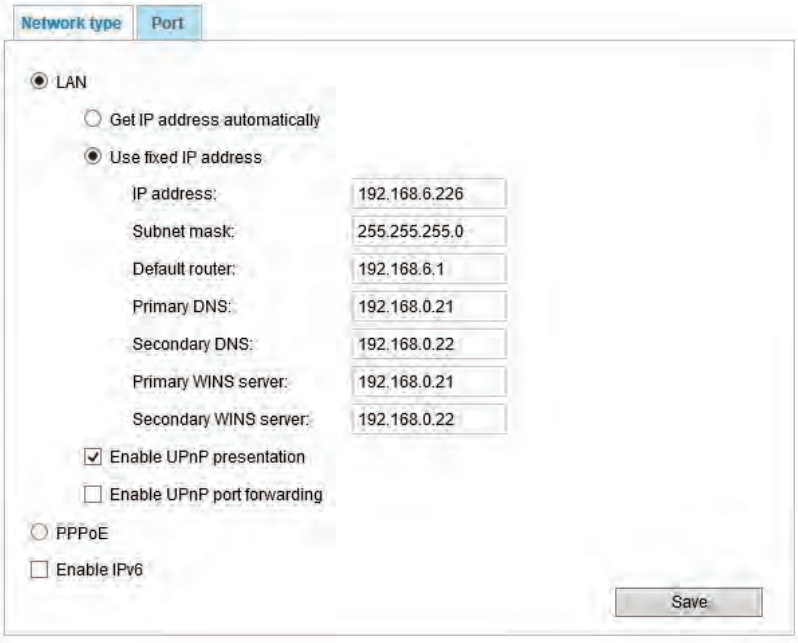
Network Type

LAN

Select this option when the Network Camera is deployed on a local area network (LAN) and is intended to be accessed by local computers. The default setting for the Network Type is LAN. Rememer to click **Save** when you complete the Network setting.

Get IP address automatically: Select this option to obtain an available dynamic IP address assigned by the DHCP server each time the camera is connected to the LAN.

Use fixed IP address: Select this option to manually assign a static IP address to the Network Camera.



1. You can use Installation Wizard on the software CD to easily set up the Network Camera on LAN. Please refer to Software Installation on page 19 for details.
2. Enter the Static IP, Subnet mask, Default router, and Primary DNS provided by your ISP.

Subnet mask: This is used to determine if the destination is in the same subnet. The default value is “255.255.255.0”.

Default router: This is the gateway used to forward frames to destinations in a different subnet. Invalid router setting will fail to send the transmission to destinations in different subnets.

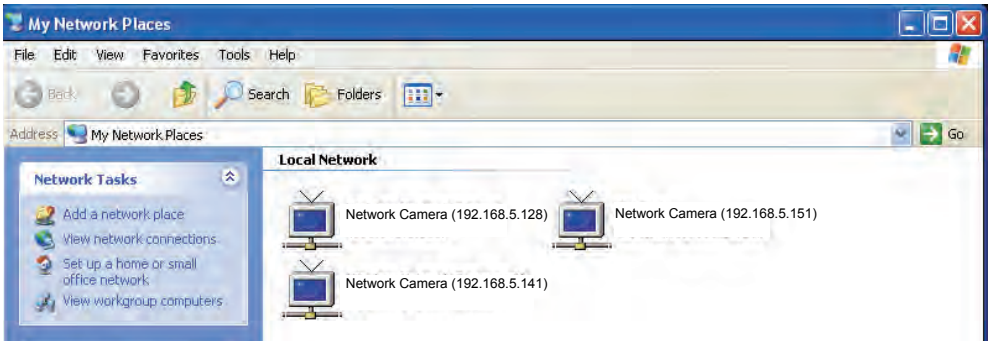
Primary DNS: The primary domain name server that translates hostnames into IP addresses.

Secondary DNS: Secondary domain name server that backups the Primary DNS.

Primary WINS server: The primary WINS server that maintains the database of computer name and IP address.

Secondary WINS server: The secondary WINS server that maintains the database of computer name and IP address.

Enable UPnP presentation: Select this option to enable UPnP™ presentation for your Network Camera so that whenever a Network Camera is presented to the LAN, shortcuts of connected Network Cameras will be listed in My Network Places. You can click the shortcut to link to the web browser. Currently, UPnP™ is supported by Windows XP or later. Note that to utilize this feature, please make sure the UPnP™ component is installed on your computer.



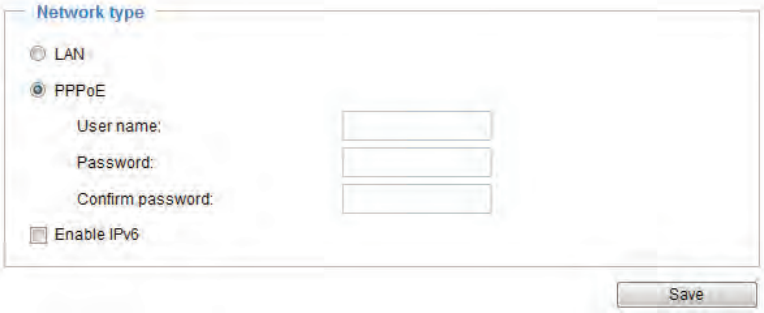
Enable UPnP port forwarding: To access the Network Camera from the Internet, select this option to allow the Network Camera to open ports on the router automatically so that video streams can be sent out from a LAN. To utilize of this feature, make sure that your router supports UPnP™ and it is activated.

PPPoE (Point-to-point over Ethernet)

Select this option to configure your Network Camera to make it accessible from anywhere as long as there is an Internet connection. Note that to utilize this feature, it requires an account provided by your ISP (service provider).

Follow the steps below to acquire your Network Camera's public IP address.

1. Set up the Network Camera on the LAN.
2. Go to Configuration > Event > Event settings > Add server (please refer to Add server on page 100) to add a new email or FTP server.
3. Go to Configuration > Event > Event settings > Add media (please refer to Add media on page 105). Select System log so that you will receive the system log in TXT file format which contains the Network Camera's public IP address in your email or on the FTP server.
4. Go to Configuration > Network > General settings > Network type. Select PPPoE and enter the user name and password provided by your ISP. Click **Save** to enable the setting.



5. The Network Camera will reboot.
6. Disconnect the power to the Network Camera; remove it from the LAN environment.

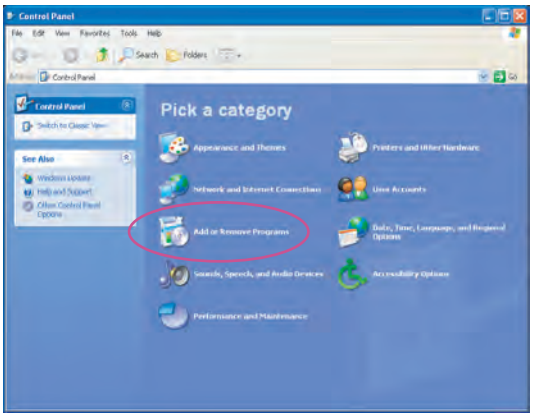
NOTE

- If the default ports are already used by other devices connected to the same router, the Network Camera will select other ports for the Network Camera.

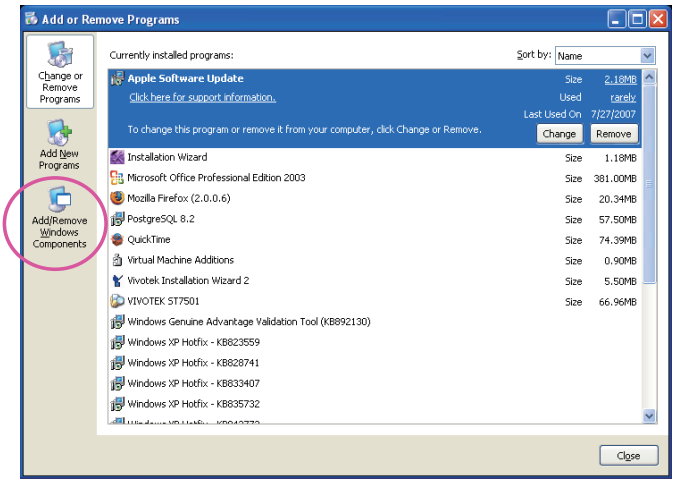
- If UPnP™ is not supported by your router, you will see the following message:
  Error: Router does not support UPnP port forwarding.

- Below are steps to enable the UPnP™ user interface on your computer:
  Note that you must log on to the computer as a system administrator to install the UPnP™ components.

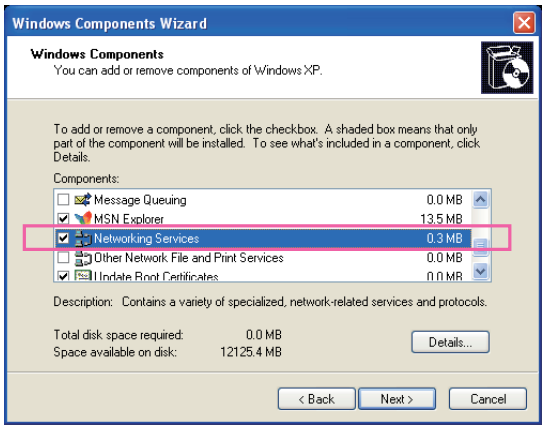
1. Go to Start, click **Control Panel**, then click **Add or Remove Programs**.



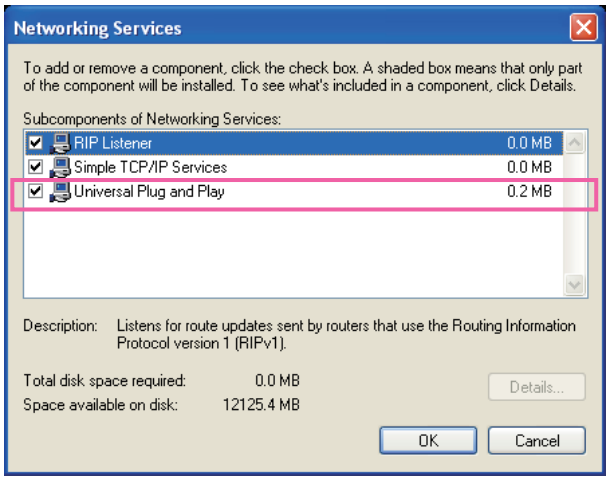
2. In the Add or Remove Programs dialog box, click **Add/Remove Windows Components**.



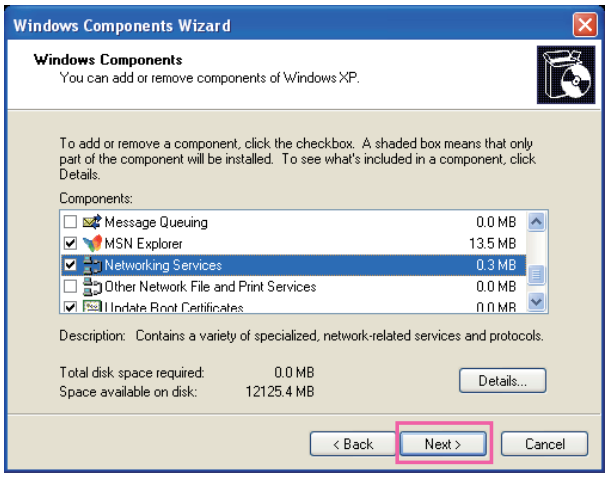
3. In the Windows Components Wizard dialog box, select **Networking Services** and click **Details**.



4. In the Networking Services dialog box, select **Universal Plug and Play** and click **OK**.



5. Click **Next** in the following window.



6. Click **Finish**. UPnP™ is enabled.

● How does UPnP™ work?
UPnP™ networking technology provides automatic IP configuration and dynamic discovery of devices added to a network. Services and capabilities offered by networked devices, such as printing and file sharing, are available among each other without the need for cumbersome network configuration. In the case of Network Cameras, you will see Network Camera shortcuts under My Network Places.

● Enabling UPnP port forwarding allows the Network Camera to open a secondary HTTP port on the router-not HTTP port-meaning that you have to add the secondary HTTP port number to the Network Camera's public address in order to access the Network Camera from the Internet. For example, when the HTTP port is set to 80 and the secondary HTTP port is set to 8080, refer to the list below for the Network Camera's IP address.

From the Internet	In LAN
http://203.67.124.123:8080	http://192.168.4.160 or http://192.168.4.160:8080

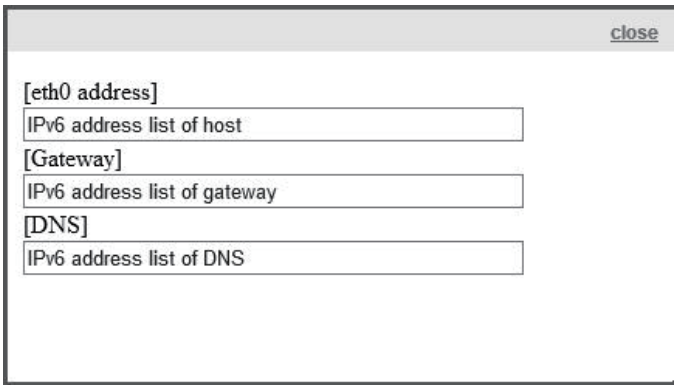
● If the PPPoE settings are incorrectly configured or the Internet access is not working, restore the Network Camera to factory default; please refer to Restore on page 46 for details. After the Network Camera is reset to factory default, it will be accessible on the LAN.

Enable IPv6

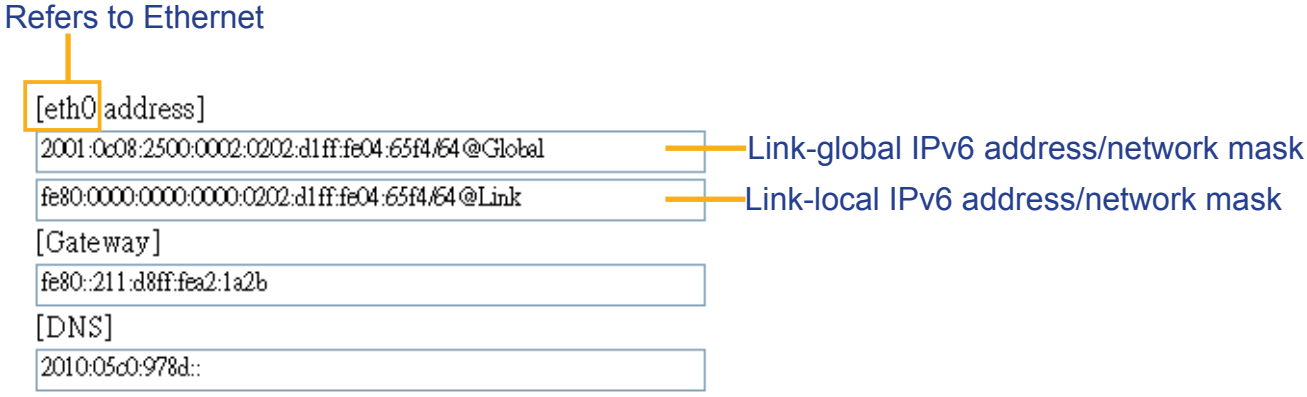
Select this option and click **Save** to enable IPv6 settings.
Please note that this only works if your network environment and hardware equipment support IPv6. The browser should be Microsoft® Internet Explorer 6.5 or above.

When IPv6 is enabled, by default, the network camera will listen to router advertisements and be assigned with a link-local IPv6 address accordingly.

IPv6 Information: Click this button to obtain the IPv6 information as shown below.

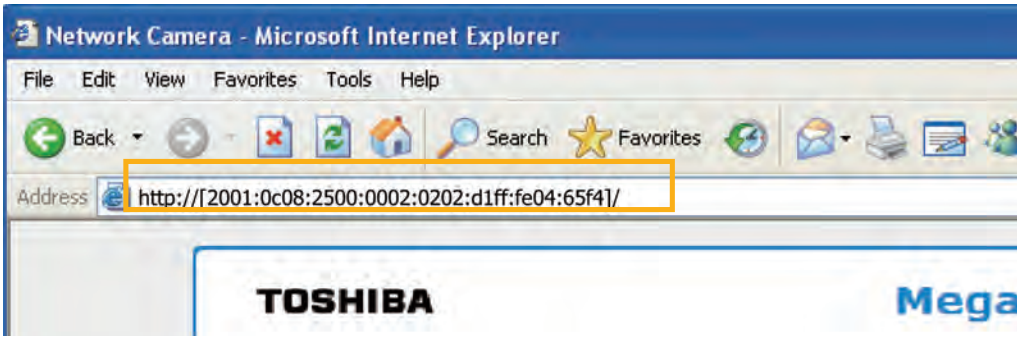


If your IPv6 settings are successful, the IPv6 address list will be listed in the pop-up window. The IPv6 address will be displayed as follows:



Please follow the steps below to link to an IPv6 address:
1. Open your web browser.
2. Enter the link-global or link-local IPv6 address in the address bar of your web browser.
3. The format should be:

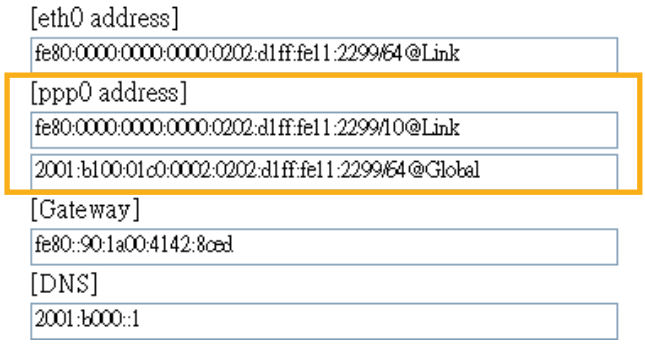
4. Press **Enter** on the keyboard or click **Refresh** button to refresh the webpage.
   For example:



NOTE

- If you have a Secondary HTTP port (the default value is 8080), you can also link to the webpage in the following address format: (Please refer to **HTTP** streaming on page 68 for detailed information.)

- If you choose PPPoE as the Network Type, the [PPP0 address] will be displayed in the IPv6 information column as shown below.



Manually setup the IP address: Select this option to manually set up IPv6 settings if your network environment does not have DHCPv6 server and router advertisements-enabled routers.
If you check this item, the following blanks will be displayed for you to enter the corresponding information:

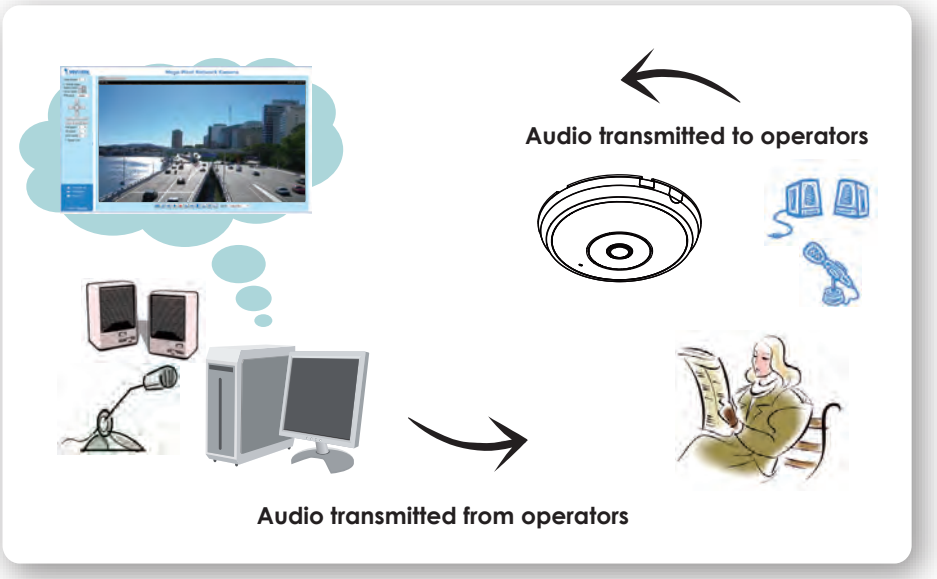
Port

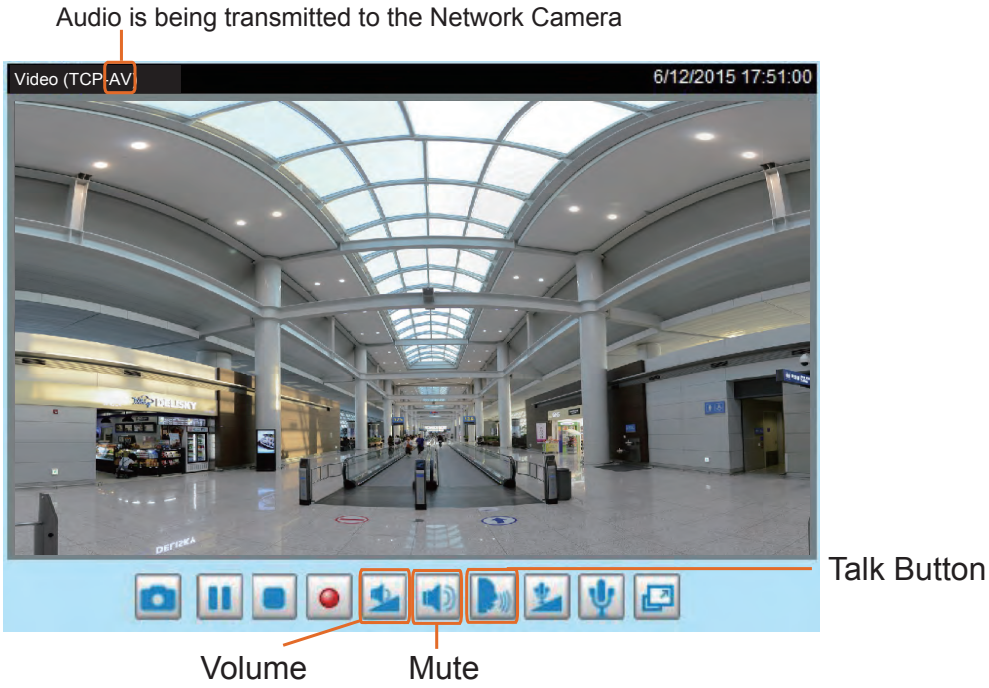
HTTPS port: By default, the HTTPS port is set to 443. It can also be assigned to another port number between 1025 and 65535.

Two way audio port: By default, the two way audio port is set to 5060. Also, it can also be assigned to another port number between 1025 and 65535.

The Network Camera supports two way audio communication so that operators can transmit and receive audio simultaneously. By using the Network Camera's built-in or external microphone and an external speaker, you can communicate with people around the Network Camera.

Note that as JPEG only transmits a series of JPEG images to the client, to enable the two-way audio function, make sure the video mode is set to H.264 on the Audio and Video > Stream > Stream settings page and the media option is set to "Video and Audio" on the Client Settings page. Please refer to Client Settings on page 35 and Stream settings on page 88.





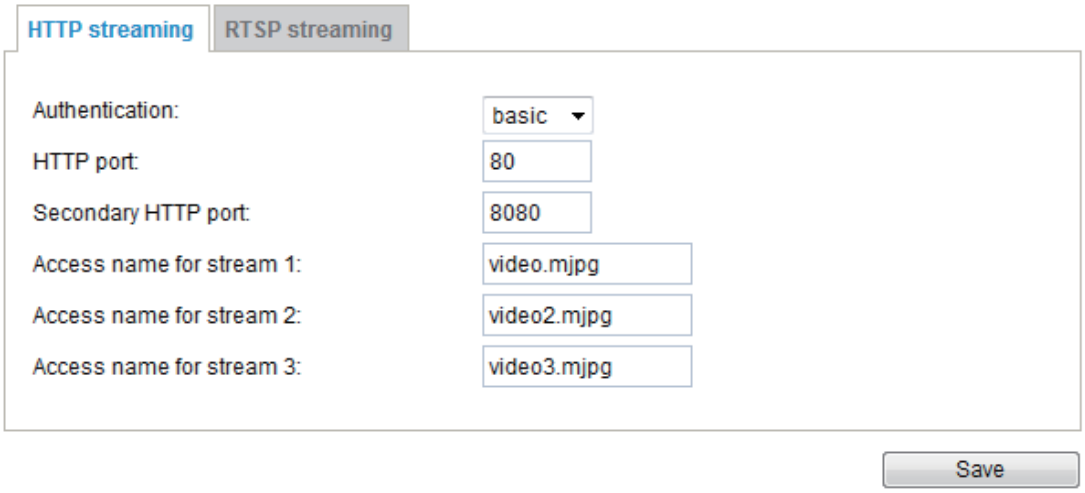
Click  to enable audio transmission to the Network Camera; click  to adjust the volume of microphone; click  to turn off the audio. To stop talking, click  again.

FTP port: The FTP server allows the user to save recorded video clips. You can use TOSHIBA Installation Wizard software to upgrade the firmware via FTP server. By default, the FTP port is set to 21. It also can be assigned to another port number between 1025 and 65535.

Network > Streaming protocols Advanced Mode

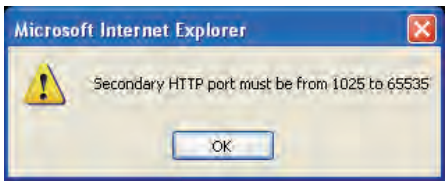
HTTP streaming

To utilize HTTP authentication, make sure that your have set a password for the Network Camera first; please refer to Security > User account on page 49 for details.



Authentication: Depending on your network security requirements, the Network Camera provides two types of security settings for an HTTP transaction: basic and digest.
If **basic** authentication is selected, the password is sent in plain text format and there can be potential risks of being intercepted. If **digest** authentication is selected, user credentials are encrypted using MD5 algorithm and thus provide better protection against unauthorized accesses.

HTTP port / Secondary HTTP port: By default, the HTTP port is set to 80 and the secondary HTTP port is set to 8080. They can also be assigned to another port number between 1025 and 65535. If the ports are incorrectly assigned, the following warning messages will be displayed:



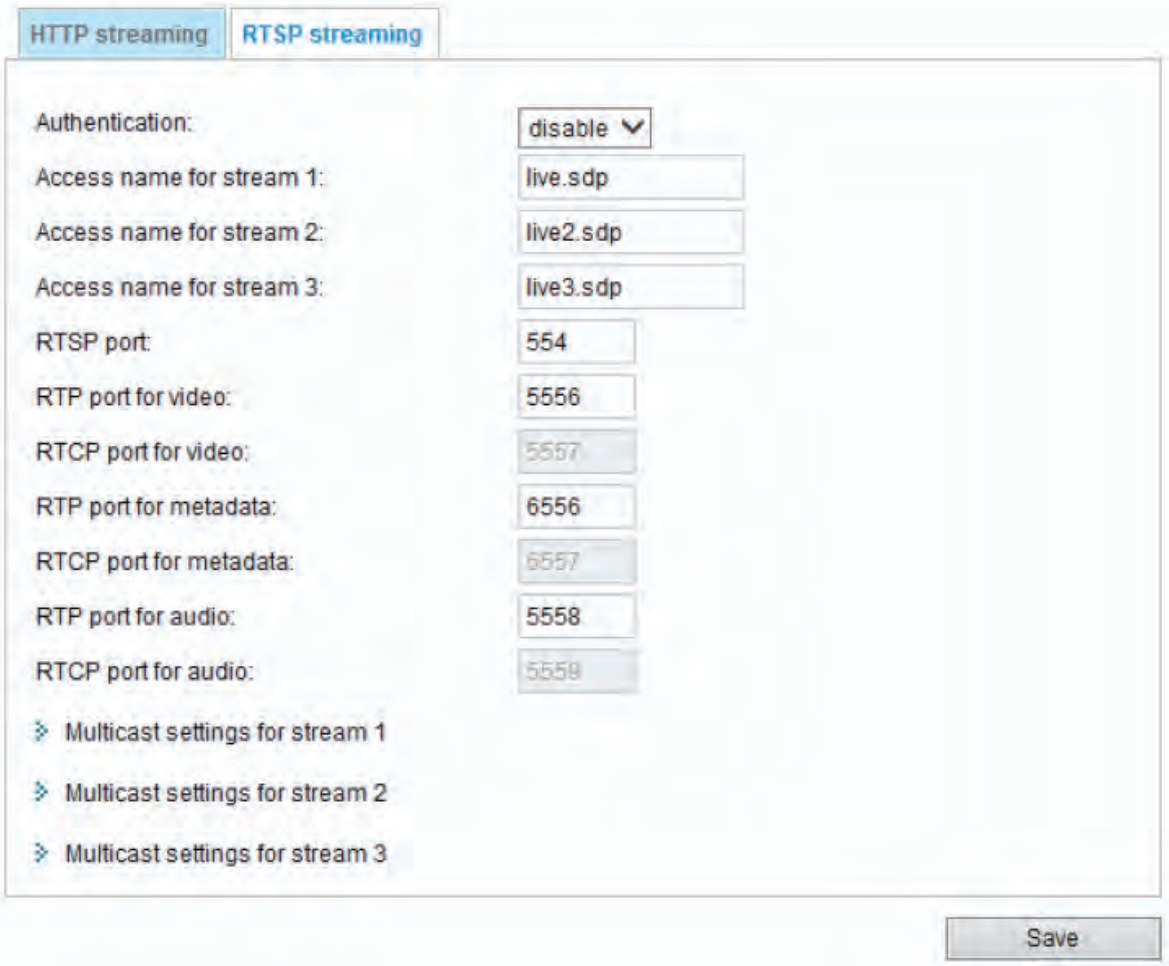
To access the Network Camera on the LAN, both the HTTP port and secondary HTTP port can be used to access the Network Camera. For example, when the HTTP port is set to 80 and the secondary HTTP port is set to 8080, refer to the list below for the Network Camera's IP address.

On the LAN
http://192.168.4.160 or http://192.168.4.160:8080

Access name for stream 1 ~ 3: This Network camera supports multiple streams simultaneously. The access name is used to differentiate the streaming source. Users can click **Audio and Video > Stream > Stream settings** to set up the video quality of linked streams. For more information about how to set up the video quality, please refer to Stream settings on page 88.

RTSP Streaming

To utilize RTSP streaming authentication, make sure that you have set a password for the Network Camera first; please refer to Security > User account on page 49 for details.

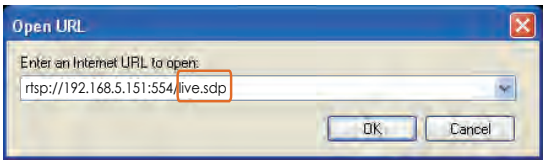


Authentication: Depending on your network security requirements, the Network Camera provides three types of security settings for streaming via RTSP protocol: disable, basic, and digest.

If **basic** authentication is selected, the password is sent in plain text format, but there can be potential risks of it being intercepted. If **digest** authentication is selected, user credentials are encrypted using MD5 algorithm, thus providing better protection against unauthorized access.

Access name for stream 1 ~ 3: This Network camera supports multiple streams simultaneously. The access name is used to differentiate the streaming source.
If you want to use an RTSP player to access the Network Camera, you have to set the video mode to H.264 and use the following RTSP URL command to request transmission of the streaming data.

rtsp://<ip address>:<rtsp port>/<access name for stream1 ~ 3>
For example, when the access name for stream 1 is set to live.sdp:
1. Launch an RTSP player.
2. Choose File > Open URL. A URL dialog box will pop up.
3. Type the above URL command in the address field.
4. The live video will be displayed in your player.



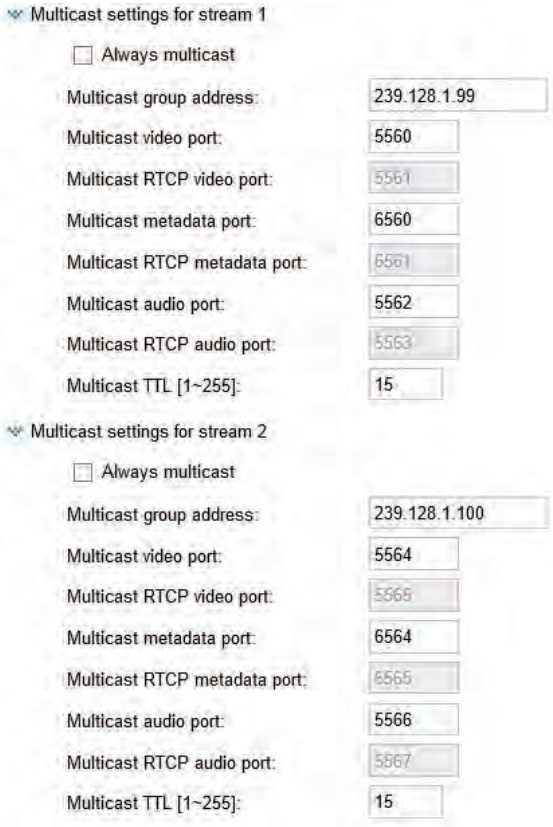
RTSP port /RTP port for video, metadata, audio/ RTCP port for video, metadata, audio

- RTSP (Real-Time Streaming Protocol) controls the delivery of streaming media. By default, the port number is set to 554.
- The RTP (Real-time Transport Protocol) is used to deliver video metadata, and audio data to the clients. By default, the RTP port for video is set to 5556 , RTP port for metadata is set to 6556 and the RTP port for audio is set to 5558.
- The RTCP (Real-time Transport Control Protocol) allows the Network Camera to transmit the data by monitoring the Internet traffic volume. By default, the RTCP port for video is set to 5557 , the RTCP port for metadata is set to 6557 and the RTCP port for audio is set to 5559.

The ports can be changed to values between 1025 and 65535. The RTP port must be an even number and the RTCP port is the RTP port number plus one, and thus is always an odd number. When the RTP port changes, the RTCP port will change accordingly.

If the RTP ports are incorrectly assigned, the following warning message will be displayed:

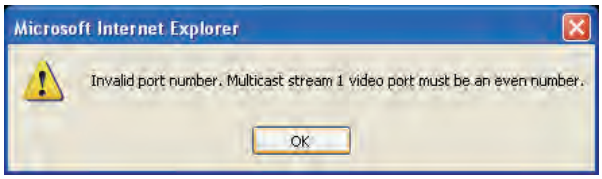
Multicast settings for stream 1 ~ 3: Click the items to display the detailed configuration information. Select the Always multicast option to enable multicast for stream 1 ~ 3.



Unicast video transmission delivers a stream through point-to-point transmission; multicast, on the other hand, sends a stream to the multicast group address and allows multiple clients to acquire the stream at the same time by requesting a copy from the multicast group address. Therefore, enabling multicast can effectively save Internet bandwith.

The ports can be changed to values between 1025 and 65535. The multicast RTP port must be an even number and the multicast RTCP port number is the multicast RTP port number plus one, and thus is always odd. When the multicast RTP port changes, the multicast RTCP port will change accordingly.

If the multicast RTP video ports are incorrectly assigned, the following warning message will be displayed:



Multicast TTL [1~255]: The multicast TTL (Time To Live) is the value that tells the router the range a packet can be forwarded.

Initial TTL	Scope
0	Restricted to the same host
1	Restricted to the same subnetwork
32	Restricted to the same site
64	Restricted to the same region
128	Restricted to the same continent
255	Unrestricted in scope

Network > DDNS

This section explains how to configure the dynamic domain name service for the Network Camera. DDNS is a service that allows your Network Camera, especially when assigned with a dynamic IP address, to have a fixed host and domain name.

DDNS: Dynamic domain name service

Enable DDNS: Select this option to enable the DDNS setting.

Provider: The provider list contains seven hosts that provide DDNS service. Please connect to the service provider's web site to review the service charges and sign-up for the service if you want to use DDNS.
ChangeIP.com
http://www.changeip.com/toshiba/
No-IP.com
http://www.no-ip.com/ext/toshiba.php

Host Name: If the User wants to use a DDNS service, enter the camera name that is registered at the DDNS server.

User Name: The User Name field is necessary for logging into the DDNS server or to notify the User of the new IP address.
Note: When this field is input as "User Name", the following field nust be input as "Password".

Password: Input the password to access the DDNS service.

Save: Click on this button to save current settings for the DDNS service.

Network > QoS (Quality of Service) Advanced Mode

Quality of Service refers to a resource reservation control mechanism, which guarantees a certain quality to different services on the network. Quality of service guarantees are important if the network capacity is insufficient, especially for real-time streaming multimedia applications. Quality can be defined as, for instance, a maintained level of bit rate, low latency, no packet dropping, etc.

The following are the main benefits of a QoS-aware network:
- The ability to prioritize traffic and guarantee a certain level of performance to the data flow.
- The ability to control the amount of bandwidth each application may use, and thus provide higher reliability and stability on the network.

Requirements for QoS

To utilize QoS in a network environment, the following requirements must be met:
- All network switches and routers in the network must include support for QoS.
- The network video devices used in the network must be QoS-enabled.

QoS models

CoS (the VLAN 802.1p model)

IEEE802.1p defines a QoS model at OSI Layer 2 (Data Link Layer), which is called CoS, Class of Service. It adds a 3-bit value to the VLAN MAC header, which indicates the frame priority level from 0 (lowest) to 7 (highest). The priority is set up on the network switches, which then use different queuing disciplines to forward the packets.

Below is the setting column for CoS. Enter the **VLAN ID** of your switch (0~4095) and choose the priority for each application (0~7).

If you assign Video the highest priority level, your network switch will handle video packets first.

NOTE

- A VLAN Switch (802.1p) is required. Web browsing may fail if the CoS setting is incorrect.
- Class of Service technologies do not guarantee a level of service in terms of bandwidth and delivery time; they offer a “best-effort.” Users can think of CoS as “coarsely-grained” traffic control and QoS as “finely-grained” traffic control.
- Though CoS is simple to manage, it lacks scalability and does not offer end-to-end guarantees since it is based on L2 protocol.

QoS/DSCP (the DiffServ model)

DSCP-ECN defines QoS at Layer 3 (Network Layer). The Differentiated Services (DiffServ) model is based on packet marking and router queuing disciplines. The marking is done by adding a field to the IP header, called the DSCP (Differentiated Services Codepoint). This is a 6-bit field that provides 64 different class IDs. It gives an indication of how a given packet is to be forwarded, known as the Per Hop Behavior (PHB). The PHB describes a particular service level in terms of bandwidth, queueing theory, and dropping (discarding the packet) decisions. Routers at each network node classify packets according to their DSCP value and give them a particular forwarding treatment; for example, how much bandwidth to reserve for it.

Below are the setting options of DSCP (DiffServ Codepoint). Specify the DSCP value for each application (0~63).

Network > SNMP (Simple Network Management Protocol)

Advanced Mode

This section explains how to use the SNMP on the network camera. The Simple Network Management Protocol is an application layer protocol that facilitates the exchange of management information between network devices. It helps network administrators to remotely manage network devices and find, solve network problems with ease.

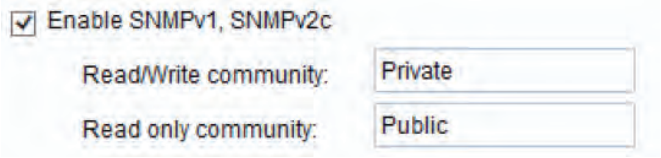
■ The SNMP consists of the following three key components:
1. Manager: Network-management station (NMS), a server which executes applications that monitor and control managed devices.
2. Agent: A network-management software module on a managed device which transfers the status of managed devices to the NMS.
3. Managed device: A network node on a managed network. For example: routers, switches, bridges, hubs, computer hosts, printers, IP telephones, network cameras, web server, and database.

Before configuring SNMP settings on the this page, please enable your NMS first.

SNMP Configuration

Enable SNMPv1, SNMPv2c

Select this option and enter the names of Read/Write community and Read Only community according to your NMS settings.



Enable SNMPv3

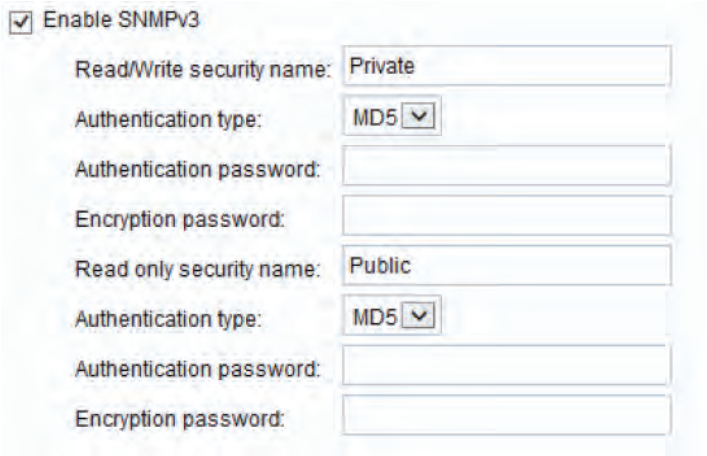
This option contains cryptographic security, a higher security level, which allows you to set the Authentication password and the Encryption password.

■ Security name: According to your NMS settings, choose Read/Write or Read Only and enter the community name.

■ Authentication type: Select MD5 or SHA as the authentication method.

■ Authentication password: Enter the password for authentication (at least 8 characters).

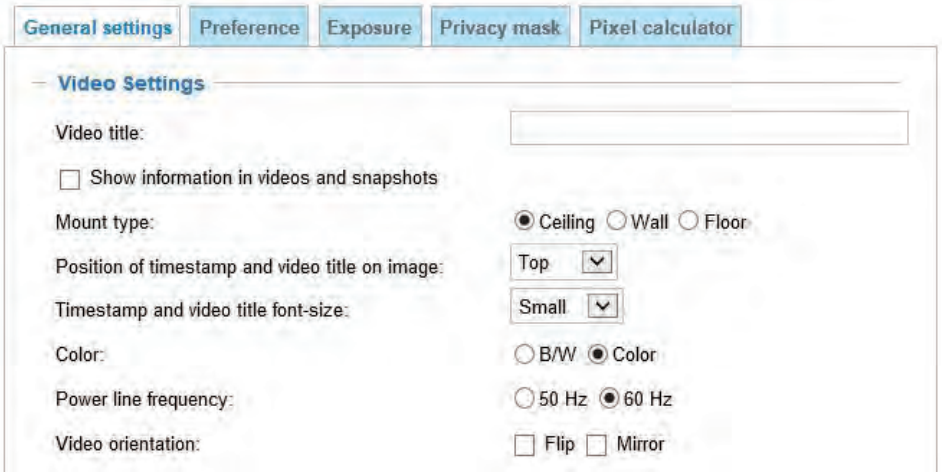
■ Encryption password: Enter a password for encryption (at least 8 characters).



Audio and Video > Image Advanced Mode

This section explains how to configure the image settings of the Network Camera. It is composed of the following four columns: General settings, Preference, Exposure, Zoom and Focus, and Privacy mask.

General settings



Video title: Enter a name that will be displayed on the title bar of the live video as the picture shown below.

Show timestamp and video title in video and snapshots: Enter a name that will be displayed on the title bar of the live video as the picture shown below. (Note: It may be unable to display with restriction of a dewarp function.)

Mount type: There are 3 Mount types - Ceiling, Wall, and Floor.
Ceiling: The Ceiling mount type automatically delivers upside-down images. The Ceiling mode supports the following Display modes - 1O, 1P, 1R, 2P, 1O3R, 4R, 4R PRO, and 1O8R.
Wall: The Wall mount type applies to the monitoring of long, side-to-side surveillance areas, such as when mounted on a wall facing a corridor. Different Mount types have different options with the Display mode settings. For example, the **1P2R** (1 Panoramic & 2 Regional) and **1P3R** (1 Panoramic & 3 Regional) display modes are only available when the “Wall“ Mount type is applied.
Floor: The Display modes with the Floor mount type are identical to those for the Ceiling mount except that the images are not vertically flipped.

Position of timestamp and video title on image: Select to display time stamp and video title on the top or at the bottom of the video stream.

Timestamp and video title font size: Select the font size for the time stamp and title.

Color: Select to display color or black/white video streams.

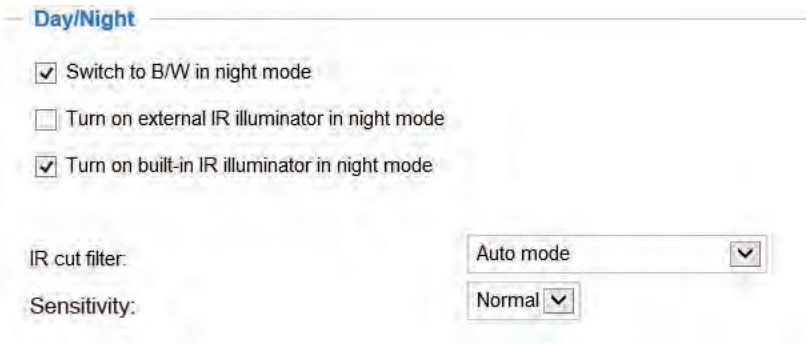
Power line frequency: Set the power line frequency consistent with local utility settings to eliminate image flickering associated with fluorescent lights. Note that after the power line frequency is changed, you must disconnect and reconnect the power cord of the Network Camera in order for the new setting to take effect.

Video orientation:

Flip - vertically reflect the display of the live video;

Mirror - horizontally reflect the display of the live video. Select both options if the Network Camera is installed upside-down (e.g., on the ceiling) to correct the image orientation. Please note that if you have preset locations, those locations will be cleared after flip/mirror setting.

Day/Night



Switch to B/W in night mode
Select this checkbox to enable the Network Camera to automatically switch to Black & White display during the night mode.

Turn on external IR illuminator in night mode
Select this to turn on an external IR illuminator (connected via Digital Output lines) when the camera detects low light condition and enters the night mode.

Turn on built-in IR illuminator in night mode
Select this to turn on the built-in IR illuminators when the camera detects low light condition and enters the night mode.

IR cut filter
With a removable IR-cut filter, this Network Camera can automatically remove the filter to let Infrared light pass into the sensor during low light conditions.

■ Auto mode
The Network Camera automatically removes the IR cut filter by judging the level of ambient light. Make sure the setup of Sensitivity to fit situation.

Note:
The Profile setting in Exposure will disable when Auto mode is selected.

■ Day mode
In day mode, the Network Camera switches on the IR cut filter at all times to block infrared light from reaching the sensor so that the colors will not be distorted.

■ Night mode
In night mode, the Network Camera switches off the IR cut filter at all times for the sensor to accept infrared light, thus helping to improve low light sensitivity.

■ Synchronize with digital input
The Network Camera automatically removes the IR cut filter when DI triggers For example, when the camera is accompanied by an external IR light that comes with its own sensor and provides a signal to the camera. Some camera housings come with such mechanism.

■ Schedule mode
The Network Camera switches between day mode and night mode based on a specified schedule. Enter the start and end time for day mode. Note that the time format is [hh:mm] and is expressed in 24-hour clock time. By default, the start and end time of day mode are set to 07:00 and 18:00.

Sensitivity
Select Low, Normal, or High sensitivity at Auto mode.
If switching between Day mode and Night mode is unstable, select Low or Normal.

NOTE

● When completed with the settings on this page, click **Save** to enable the settings.

Preference

On this page, you can tune the White balance, Image adjustment, WDR enhancement and 3D Noise reduction parameters. You can configure two sets of preferred settings: one for normal situations, the other for special situations, such as day/night/schedule mode.

Sensor Setting 1:
For normal situations

Sensor Setting 2:
For special situations

White balance: Adjust the value for the best color temperature.

■ Auto: It will automatically adjust the color temperature of the light in response to different light sources. You may follow the steps below to adjust the white balance to the best color temperature.

1. Set the White balance to **Auto**.
2. Place a sheet of white paper in front of the lens, then allow the Network Camera to adjust the color temperature automatically.
3. Click the **On** button of **Fix current value** and confirm the setting while the white balance is being measured.

■ Manual: This item allows users to manually tune the R gain & B gain ratios.

Image Adjustment

■ Brightness: Adjust the image brightness level, which ranges from 0% to 100%.
■ Contrast: Adjust the image contrast level, which ranges from 0% to 100%.
■ Saturation: Adjust the image saturation level, which ranges from 0% to 100%.
■ Sharpness: Adjust the image sharpness level, which ranges from 0% to 100%.
■ Gamma curve: Select the **Optimize** mode. Or select the **Manual** mode, and pull the slide bar pointer to change the preferred level of Gamma correction towards higher contrast or towards the higher luminance for detailed expression for both dark and lighted areas of an image.

■ Enable low light compensation: Select this option in low light mode, and the values of sharpness and brightness will change automatically as the noise reduction function.

NOTE: Sharpness may be temporarily emphasized as it becomes dark.

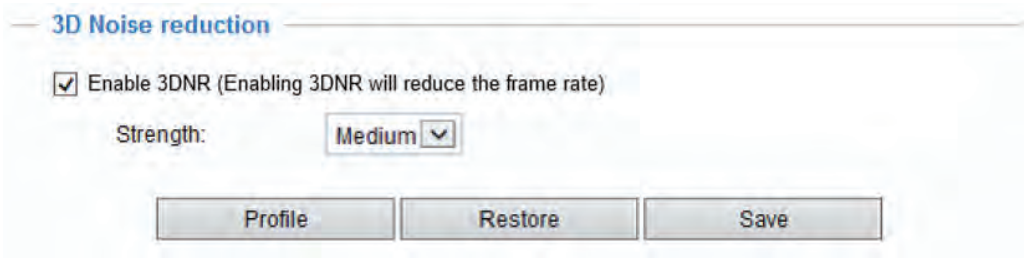
WDR enhancement

This function allows users to identify more image details with an extreme contrast from an object of interest with one shadowed side against a bright background, e.g., an entrance.

You may select the **Enable WDR enhancement** check-box, and then adjust the strength (low, medium, high) to reach the best image quality.

3D noise reduction

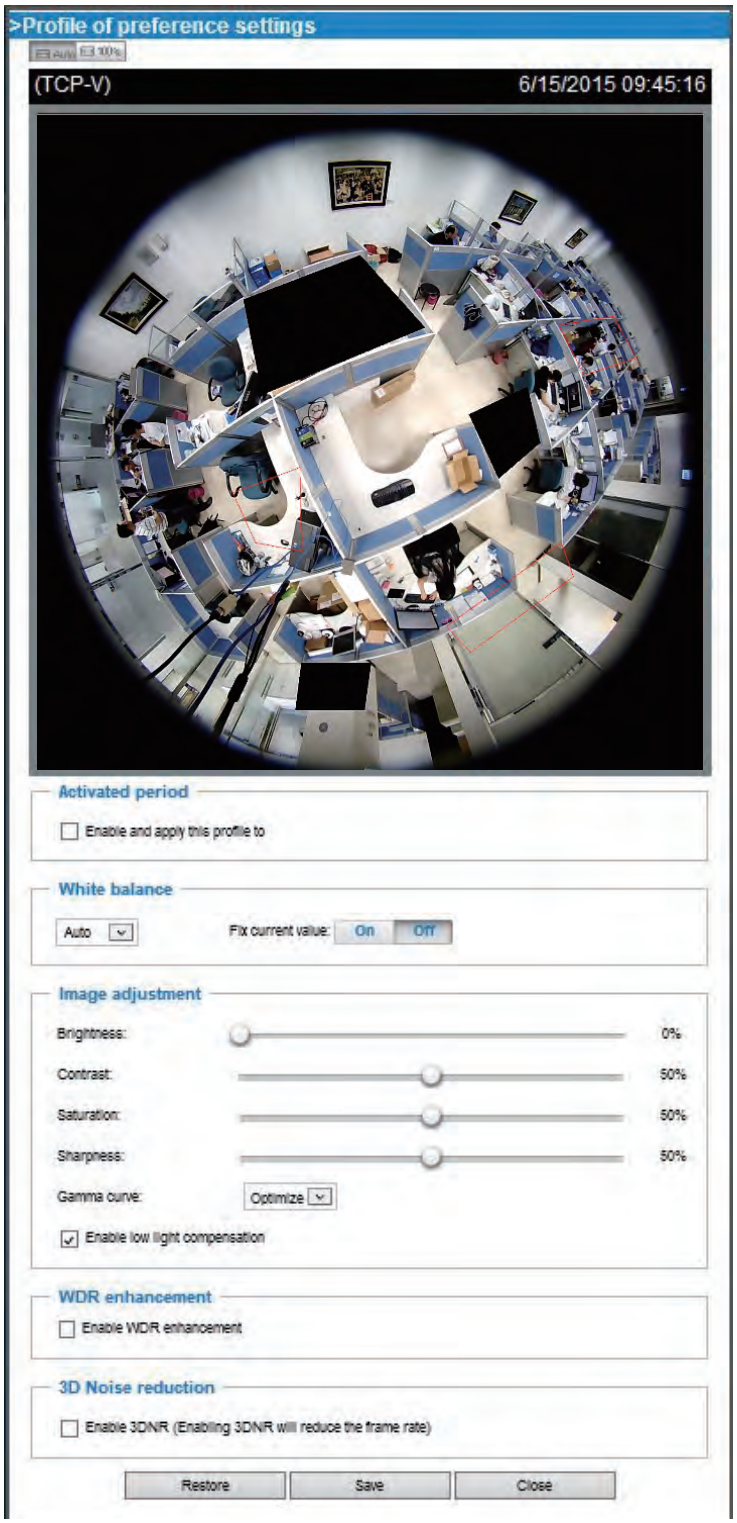
■ Enable 3DNR: Check to enable 3DNR in order to reduce noises and flickers in image. Use the pull-down menu to adjust the reduction strength.



NOTE

- Applying 3D noise reduction will consume processor resource, maximum frame rate will reduce by half.
- When enabling/disabling 3D noise reduction, a momentary noise may occur in the image.
- 3D Noise Reduction is mostly applied in low-light conditions. On the other hand, when enabled in a low-light condition with fast moving objects, trails of after-images may occur. You may then select a lower strength level or disable the function.
- When completed with the settings on this page, click Save to enable the settings.

If you want to configure another sensor setting for day/night/schedule mode, please click **Profile** to open the Profile Settings page as shown below.

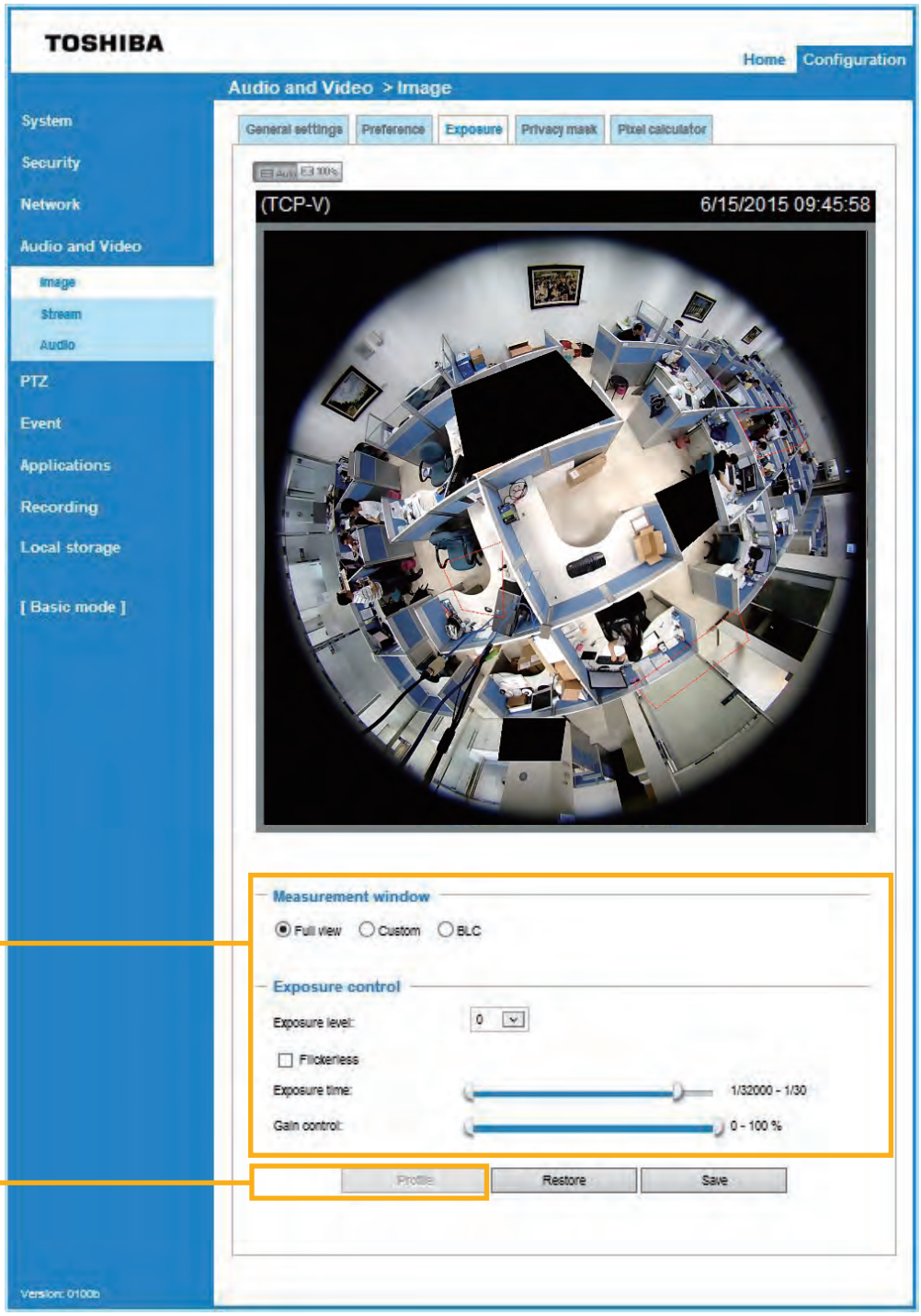


Please follow the steps below to setup a profile:

1. Check **Enable and apply this profile**.
2. Select the applied mode: Day mode, Night mode, or Schedule mode. Please manually enter a range of time if you choose Schedule mode.
3. Configure the settings in the following columns. Please refer to the previous page for detailed information.
4. Click **Save** to enable the settings and click **Close** to exit the page.

Exposure Advanced Mode

On this page, you can set the Exposure measurement window, Exposure level, and Exposure control, You can configure two sets of Exposure settings: one for normal situations, the other for special situations, such as day/night/schedule mode.



Sensor Setting 1:
For normal situations

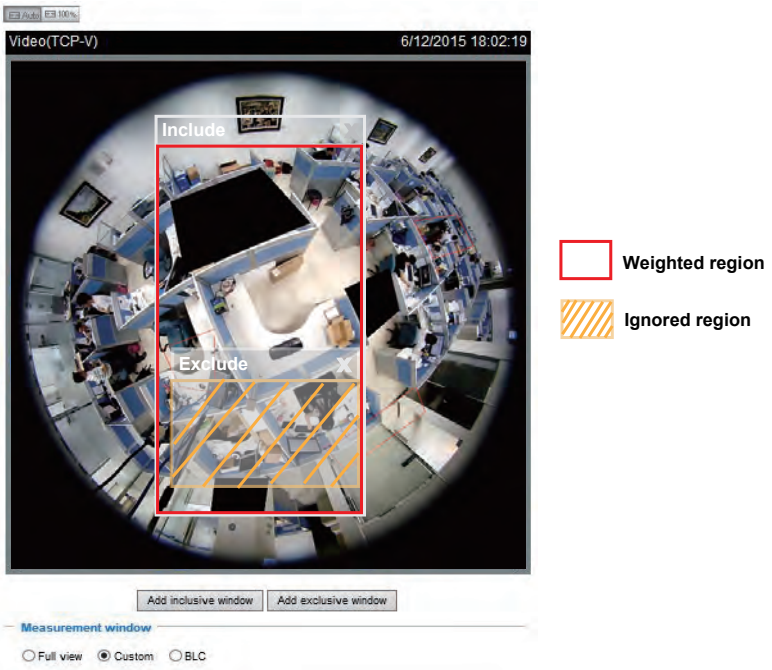
Sensor Setting 2:
For special situations

Measurement Window: This function allows users to set measurement window(s) for low light compesation.

■ Full view: Calculate the full range of view and offer appropriate light compesation.

■ Custom: This option allows you to manually add customized windows as inclusive or exclusive regions. A total of 10 windows can be set. Please refer to the next page for detailed illustration.

The inclusive window refers to “weighted window“; the exclusive window refers to “ignored window“. It adopts the weighted averages method to calculate the value.



■ BLC (Back Light Compensation): This option will automatically add a “weighted region“ in the middle of the window and give the necessary light compensation.

Exposure control:

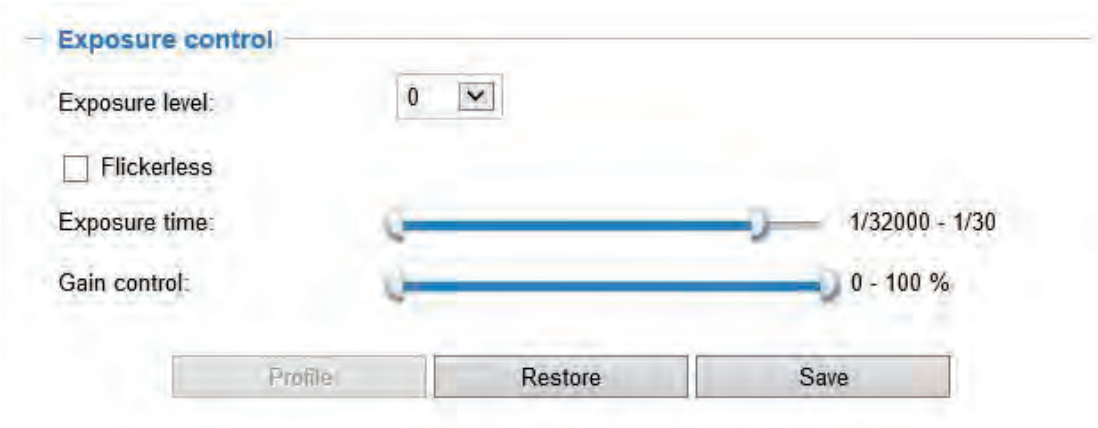
■ Exposure level: You can manually set the Exposure level, which ranges from -2.0 to +2.0 (dark to bright).

■ Flickerless: Under some circumstances when there is a difference between the video capture frequency and local AC power frequency (50Hz or 60Hz) due to the electronic rolling shutters of CMOS sensor, the mismatch causes color shifts or flickering images. If the above mismatch occurs, select the Flickerless check-box, and the range of Exposure time will be limited to a range in order to match the AC power frequency. See the screen capture below.

You can click and drag the semi-circular pointers on the **Exposure time** and **Gain control** slide bars to specify a range of shutter time and Gain control values within which the camera can automatically tune to an optimal imaging result. For example, you may prefer a shorter shutter time to better capture moving objects, while a faster shutter reduces light and needs to be compensated by electrical brightness gains.

NOTE

* In a setup of **Exposure time** and **Gain control**, do not set maximum and minimum value as equal.



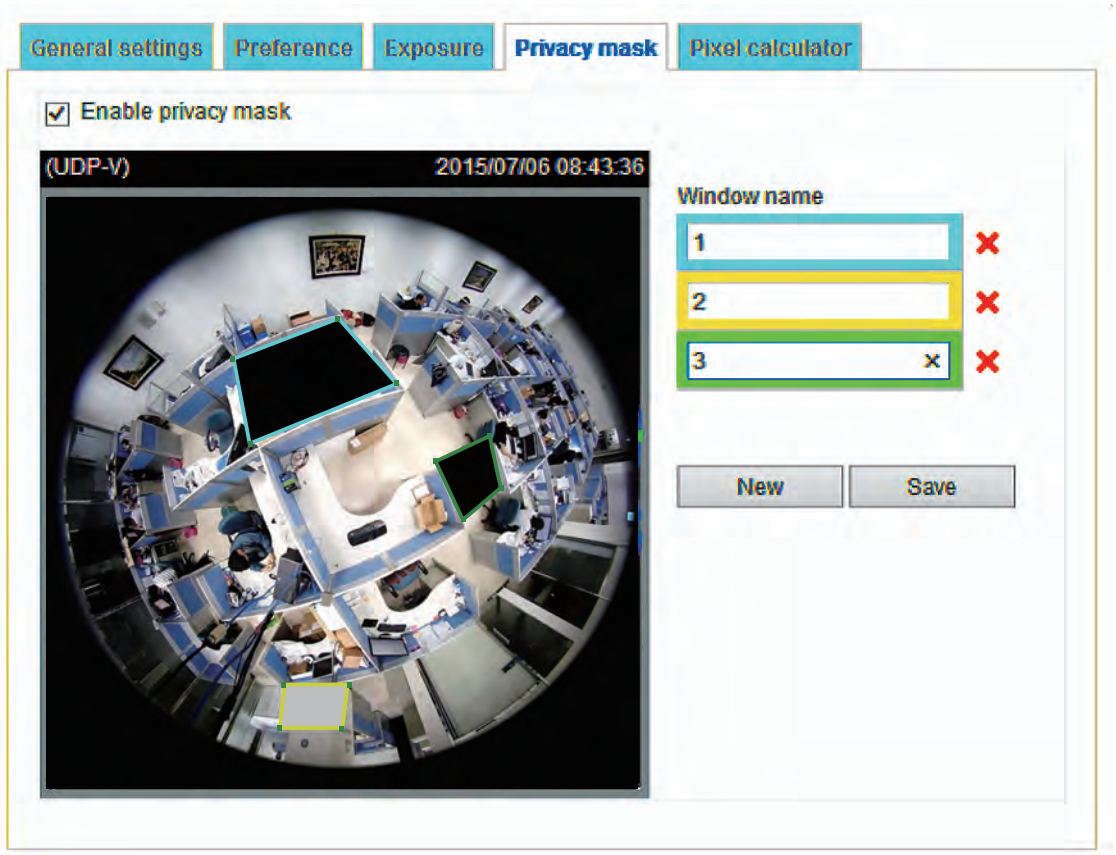
If you want to configure another sensor setting for day/night/schedule mode, please click **Profile** to open the Profile settings page as shown below.

Please follow the steps below to setup a profile:

1. Check **Enable and apply this profile**.
2. Select the applied mode: Day mode, Night mode, or Schedule mode. Please manually enter a range of time through which you want the Schedule mode to apply.
3. Configure Exposure control and True WDR settings in the folowing columns. Please refer to the previous page for detailed information.
4. Click **Save** to enable the setting and click **Close** to exit the page.

Privacy mask Advanced Mode

Click **Privacy Mask** to open the settings page. On this page, you can block out certain sensitive zones to address privacy concerns.



■ To set the privacy mask windows, follow the steps below:

1. Click **New** to add a new window. A text box will appear allowing you to enter a name for the mask.
2. Use four mouse clicks to mark a square area, which is recommended to be at least twice the size of the object (height and width) you want to cover.
3. Enter a Window Name and click **Save** to enable the setting.
4. Check **Enable privacy mask** to enable this function.

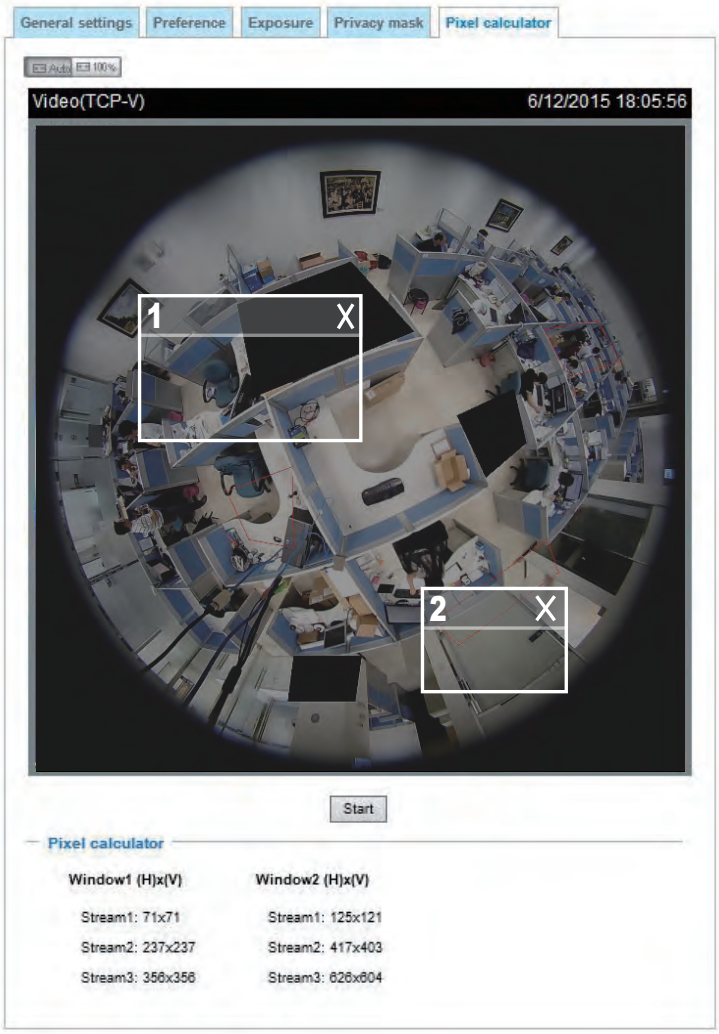
NOTE

- Up to 5 privacy mask windows can be configured on the same screen.
- If you want to delete a configured mask window, click on the 'X' button at the side of window name and then click on the Save button.

Pixel Calculator

Click the **Start** button at the lower screen to create a pixel calculator window. Place your cursor on the window to move it to an area of your interest, and change the size of window to fit the area of interest.

Once they are drawn, the numbers of pixels on the sides of windows will appear. This allows you to calculate if your current configuration fulfills a requirement, for instance, for recognizing the faces of persons passing through a location. A facial recognition usually requires around 130 pixels per meter or higher.



The pixels thus calculated are listed at the lower screen on a per-stream basis depending on the frame size you configure for each video stream.

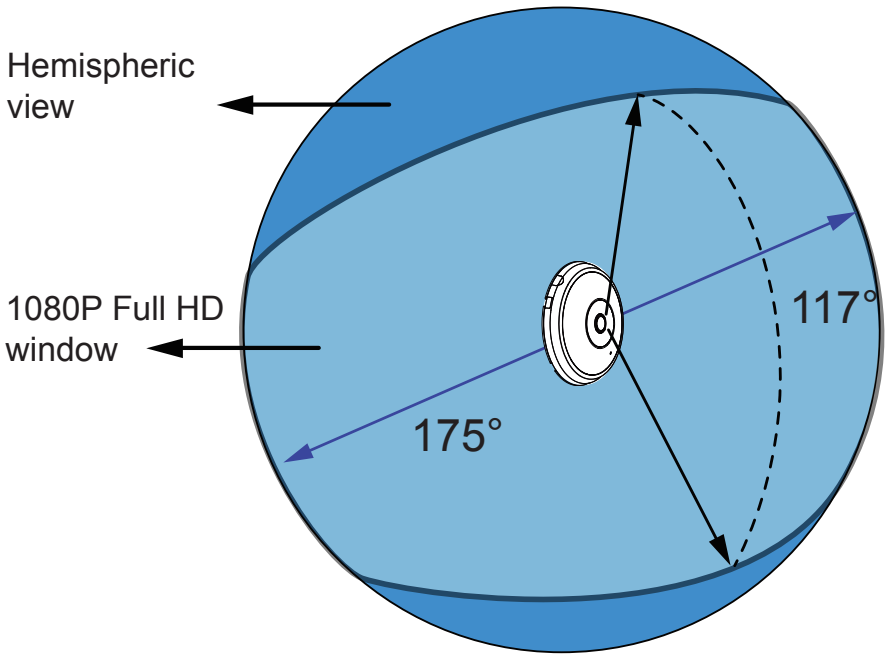
Audio and Video > Stream

FOV (Field of View)

The Field of View window allows you to select either the Hemispheric View or a 1080P Full HD mode. The 1080P Full HD mode provides a dewarpped section (1920x1080 pixels) out of the 175 degrees hemispheric view. The 1080P Full HD mode provides a higher frame rate of up to 30fps. It is as if using the panoramic camera as a standard fixed dome camera with a wide view angle.

In the 1080P Full HD mode, selection of display mode will not be available. Also, changing the FOV option will erase the motion detection, privacy mask, and preset postions you previously configured.

Below is a conceptual drawing showing the coverage of the 1080P Full HD mode.

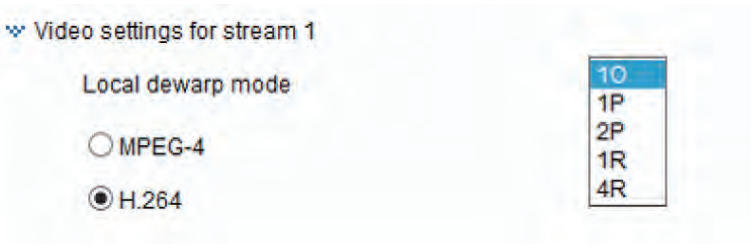


NOTE

If the FOV 1080P mode is selected, the Local dewarp function will not be available.

Stream settings Advanced Mode

Local dewarp mode:
You can set up different local dewarp mode from drop down list in stream 1 and stream 2. If you disable this function, select 1O from the list.

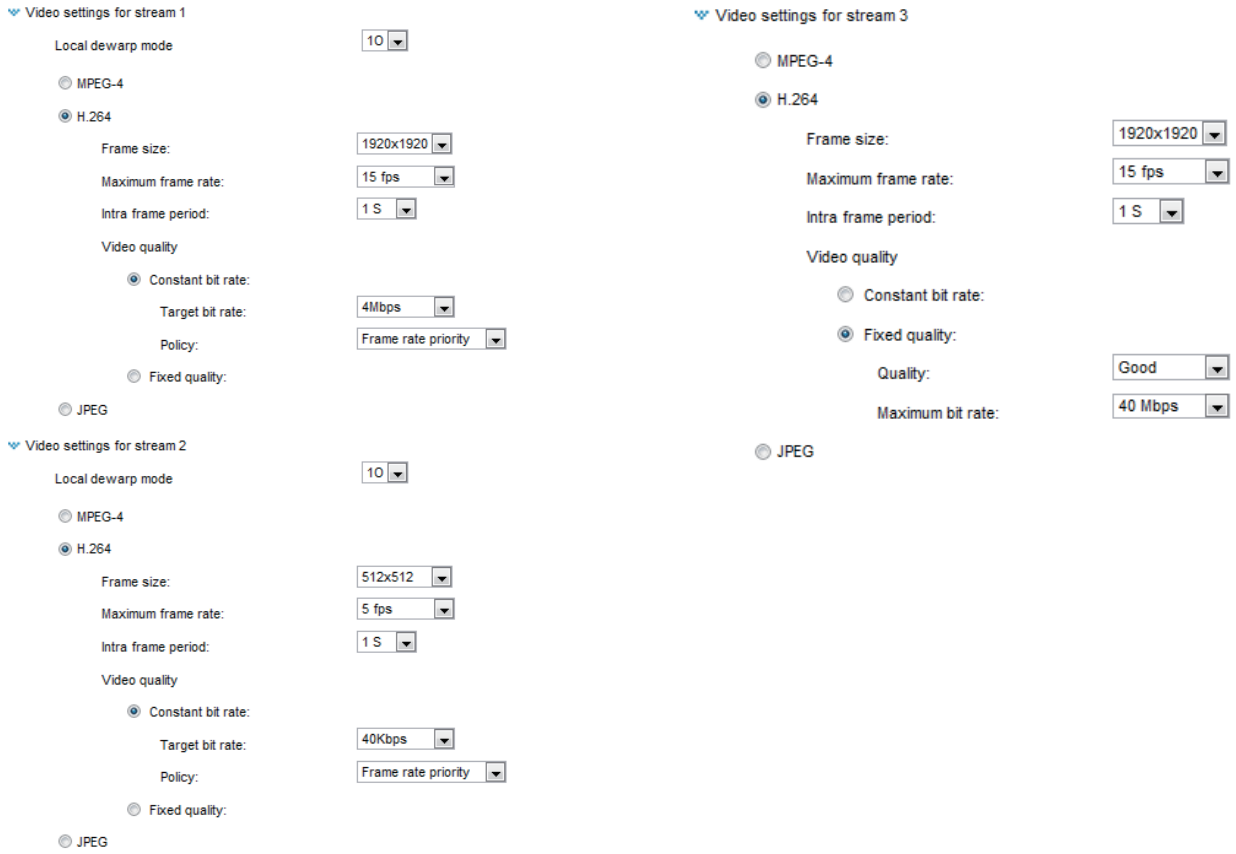


This Network Camera supports multiple streams with frame size ranging from 192 x 192 to 1920 x 1920 pixels.

Please follow the steps below to set up those settings for an individual stream:
1. Select a stream to configure its viewing region.
2. Choose a proper Frame Size from the drop-down list according to the size of monitored device.
3. Select the Maximum frame rate.

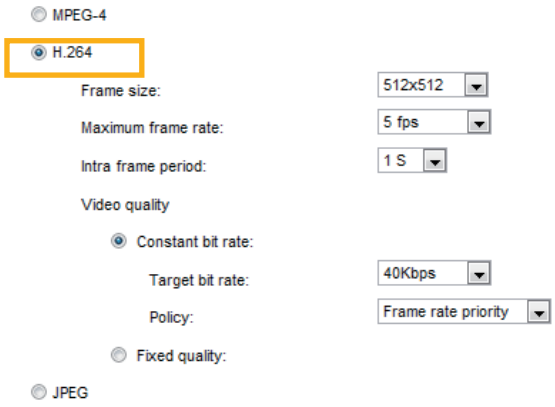
To change the frame size, frame rate, and other related settings, click on stream settings for a video stream to its individual configuration panel.

Click the stream item to display the detailed information.



This Network Camera offers real-time H.264, MPEG-4 and MJPEG compression standards (Triple Codec) for real-time viewing.

If **H.264** or **MPEG-4** mode is selected, the video is streamed via RTSP protocol. There are several parameters for you to adjust the video performance:



■ Frame size

You can set up different video resolutions for different viewing devices. For example, set a smaller frame size and lower bit rate for remote viewing on mobile phones and a larger video size and a higher bit rate for live viewing on web browsers. Note that a larger frame size takes up more bandwidth.

■ Maximum frame rate

This limits the maximum refresh frame rate per second. Set the frame rate higher for smoothlier video quality.

Regardless of the power line frequency setting (60Hz or 50Hz), the frame rates are selectable at 1fps, 2fps, 3fps, 5fps, 8fps, 10fps, 12fps, and 15fps. You can also select **Customize** and manually enter a value.

■ Intra frame period
Determine how often to plant an I frame. The shorter the duration, the more likely you will get better video quality, but at the cost of higher network bandwidth consumption. Select the intra frame period from the following durations: 1/4 second, 1/2 second, 1 second, 2 seconds, 3 seconds, and 4 seconds.

■ Video quality

- Constant bit rate: A complex scene generally produces a larger file size, meaning that higher bandwidth will be needed for data transmission. The bandwidth utilization is configurable to match a selected level, resulting in mutable video quality performance. The bit rates are selectable at the following rates: 20Kbps, 30Kbps, 40Kbps, 50Kbps, 64Kbps, 128Kbps, 256Kbps, 512Kbps, 768Kbps, 1Mbps, 2Mbps, 3Mbps, 4Mbps, 6Mbps, 8Mbps, 10Mbps, 12Mbps, 14Mbps and 16Mbps. You can also select **Customize** and manually enter a value up to 40Mbps.
  - Target bit rate: select a bit rate from the pull-down menu. The bit rate ranges from 20kbps to a maximum of 16Mbps. The bit rate then becomes the Average or Upper bound bit rate number. The Network Camera will strive to deliver video streams around or within the bit rate limitation you impose.
  - Policy: If Frame Rate Priority is selected, the Network Camera will try to maintain the frame rate per second performance, while the image quality will sometimes be compromised. If Image quality priority is selected, the Network Camera might drop some video frames in order to maintain image quality.
- Fixed quality: On the other hand, if Fixed quality is selected, all frames are transmitted with the same quality; bandwidth utilization is therefore unpredictable.

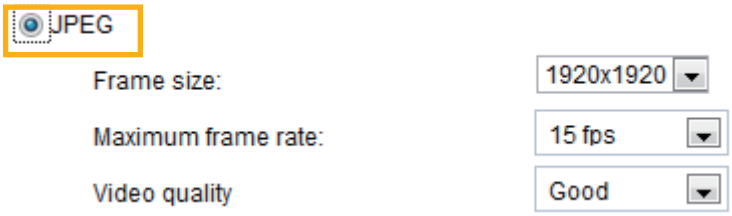
  - Quality: The video quality can be adjusted to the following settings:
  Acceptable, Satisfactory, Good, Very Good, and Excellent. You can also select Customize and manually enter a value.

  - Maximum bit rate: With the guaranteed image quality, you might still want to place a bit rate limitation to control the size of video streams for bandwidth and storage concerns. The configurable bit rate starts from 1Mbps to 40Mbps.

  The Maximum bit rate setting in the Fixed quality configuration can ensure a reasonable and limited use of network bandwidth. For example, in low light conditions where a Fixed quality setting is applied, video packet sizes can tremendously increase when noises are produced with electrical gain.

  You may also manually enter a bit rate number by selecting the **Customized** option.

If **JPEG** mode is selected, the Network Camera continuously sends JPEG images to the client, producing a moving effect similar to a filmstrip. Every single JPEG image transmitted guarantees the same image quality, which in turn comes at the expense of variable bandwidth usage. Because the media contents are a combination of JPEG images, no audio data is transmitted to the client. There are three parameters provided in MJPEG mode to control the video performance:



■ Frame size
You can set up different video resolution for different viewing devices. For example, set a smaller frame size and lower bit rate for remote viewing on mobile phones and a larger video size and a higher bit rate for live viewing on web browsers. Note that a larger frame size takes up more bandwidth.

■ Maximum frame rate
This limits the maximum refresh frame rate per second. Set the frame rate higher for smoother video quality.
The frame rates are selectable at 1fps, 2fps, 3fps, 5fps, 8fps, 10fps, 12fps and 15fps. You can also select **Customize** and manually enter a value. The frame rate will decrease if you select a higher resolution.

■ Video quality
Refer to the previous page setting an average or upper bound threshold for controlling the bandwidth consumed for transmitting motion jpegs. The configuration method is identical to that for MPEG4 and H.264.

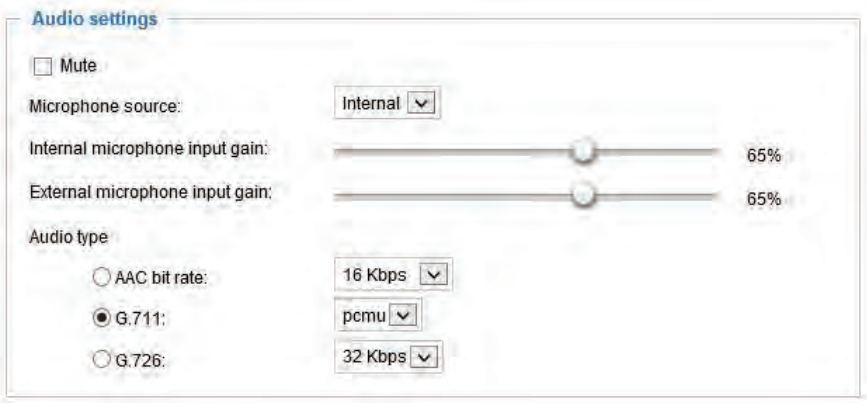
NOTE

► *Video quality and fixed quality refers to the compression rate. If you select to enter a Customized value in the Fixed quality menu, a lower value will produce higher quality.*

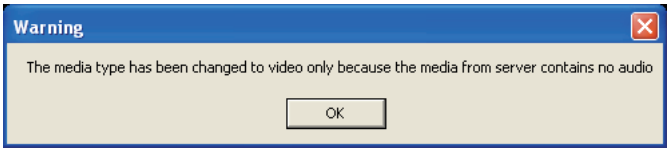
► *Converting high-quality video may significantly increase the CPU loading, and you may encounter streaming disconnection or video loss while capturing a complicated scene. In the event of occurance, we suggest you customize a lower video resolution or reduce the frame rate to obtain smooth video.*

Audio and Video > Audio

Audio Settings



Mute: Select this option to disable audio transmission from the Network Camera to all clients. Note that if muted, no audio data will be transmitted even if audio transmission is enabled on the Client Settings page. In that case, the following message is displayed:



Note: When enabling/disabling this function, video streaming will be disconnected, and reconnected after 45 seconds.

Microphone source: Select the microphone internal or external.

Internal microphone input gain: Select the gain of the internal audio input according to ambient conditions. Adjust the gain from 100% (most sensitive) to 0% (least sensitive).

External microphone input gain: Select the gain of the external audio input according to ambient conditions. Adjust the gain from 100% (most sensitive) to 0% (least sensitive).

Audio type: Select audio codec AAC or GSM-AMR and the bit rate.

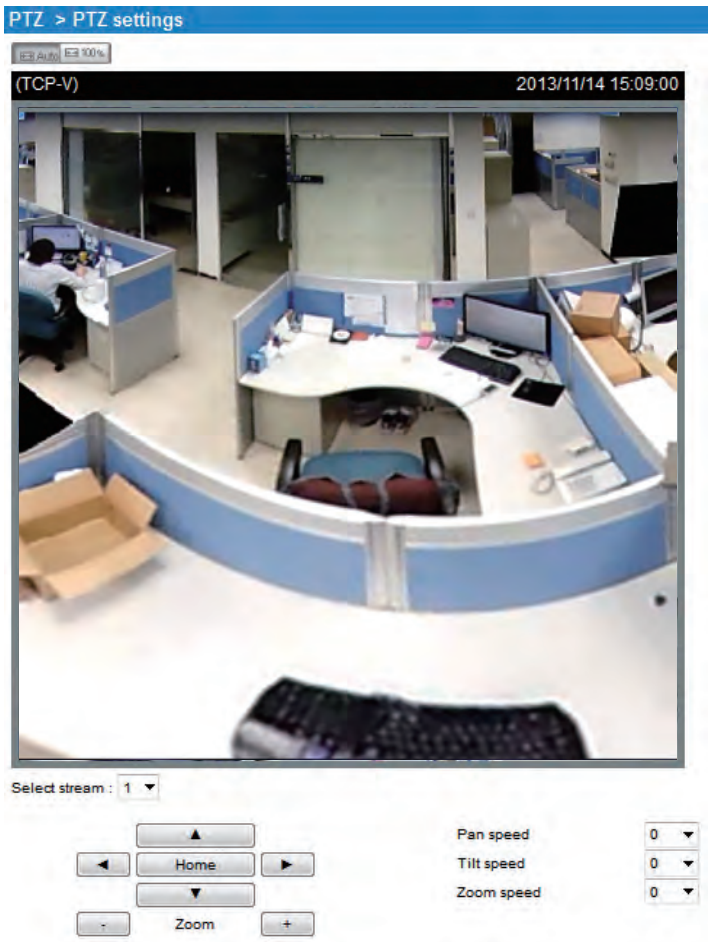
- AAC provides good sound quality at the cost of higher bandwidth consumption. The bit rates are selectable from: 16Kbps, 32Kbps, 48Kbps, 64Kbps, 96Kbps, and 128Kbps.
- G.711 also provides good sound quality and requires about 64Kbps. Select pcmu (μ-Law) or pcma (A-Law) mode.
- G.726 is a speech codec standard covering voice transmission at rates of 16, 24, 32, and 40kbit/s.

When completed with the settings on this page, click **Save** to enable the settings.

PTZ > PTZ settings

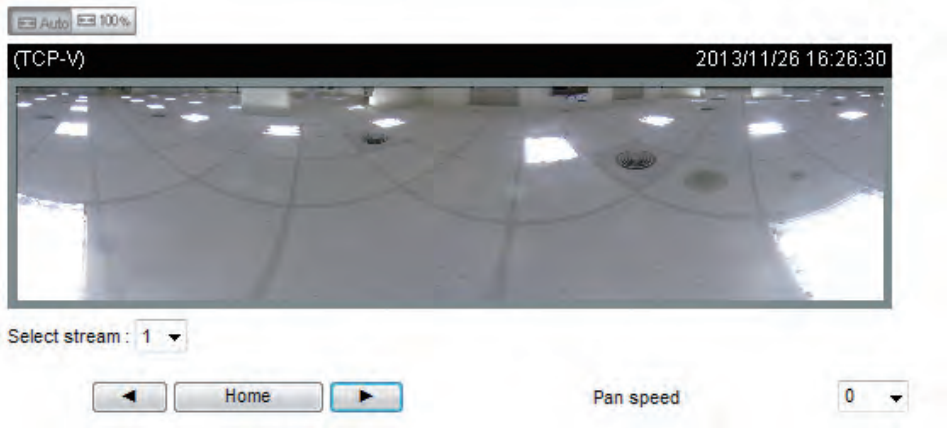
This window is functional only when you configure a video stream to be using the Local dewarp function.

Changing the Field of View



In this window, functional items related to the preset positions have been cancelled. This window is now used for changing the field of view when the Local dewarp is applied to a video stream.

1. First select a video stream for which the field of view will take effect. Note that you must manually select a Local dewarp mode (e.g., 1R or 1P) in Audio and Video > Stream > Stream first.

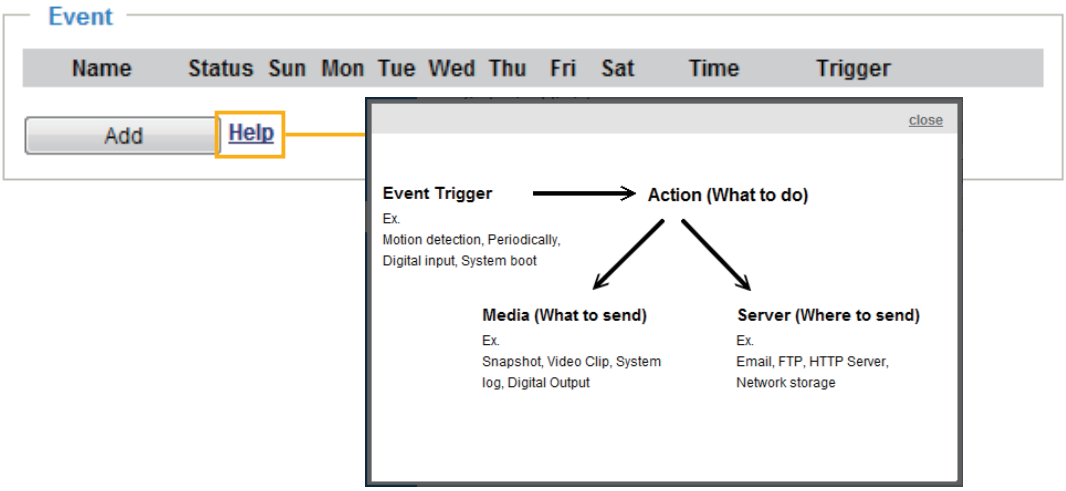


2. Adjust the shooting area to the desired position using the PTZ keypad on the live screen.

Note that the pan, tilt, zoom speeds only applies in this window. They do not apply to the live view in Main Page

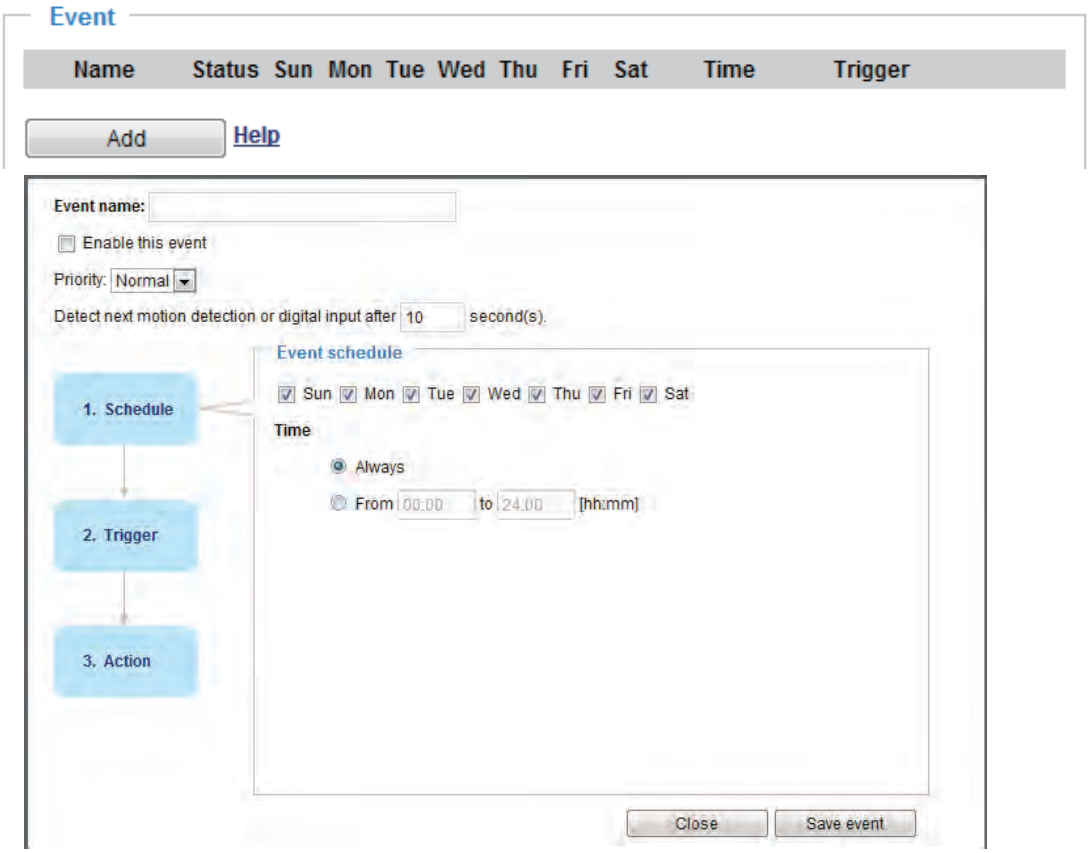
Event > Event settings Advanced Mode

This section explains how to configure the Network Camera to respond to particular situations (event). A typical application is that when a motion is detected, the Network Camera sends buffered images to an FTP server or e-mail address as notifications. Click on **Help**, there is an illustration shown in the pop-up window explaining that an event can be triggered by many sources, such as motion detection or external digital input devices. When an event is triggered, you can specify what type of action that will be performed. You can configure the Network Camera to send snapshots or videos to your email address or FTP site.



Event

To set an event with recorded video or snapshots, it is necessary to configure the server and media settings so that the Network Camera will know what action to take (such as which server to send the media files to) when a trigger is activated. An event is an action initiated by a user-defined trigger source. In the **Event** column, click **Add** to open the event settings window.



■ Event name: Enter a name for the event setting.

■ Enable this event: Select this option to enable the event setting.

■ Priority: Select the relative importance of this event (High, Normal, or Low). Events with a higher priority setting will be executed first.

■ Detect next event after ☐ seconds: Enter the duration in seconds to pause motion detection after a motion is detected. This can prevent event-related actions to be too frequently performed.

Follow the steps 1~3 to arrange the three elements -- Schedule, Trigger, and Action to set an event. A total of 3 event settings can be configured.

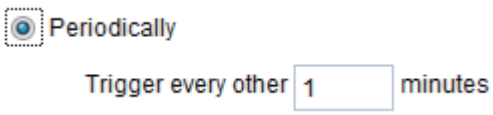
1. Schedule
Specify the period for the event. Please select the days of the week and the time in a day (in 24-hr time format) to specify when will the event-triggering conditions take effect.

2. Trigger
This is the cause or stimulus which defines what will trigger the event. The trigger source can be configured to use the Network Camera's built-in motion detection mechanism or external digital inputs.

There are several choices of trigger sources as shown on next page. Select each item to display its related options.

■ Video motion detection
This option makes use of the built-in motion detection mechanism as a trigger source. To enable this function, you need to configure a Motion Detection Window first. For more information, please refer to Motion Detection on page 109 for details.

■ Periodically
This option allows the Network Camera to trigger periodically for every other defined minute. Up to 999 minutes are allowed.



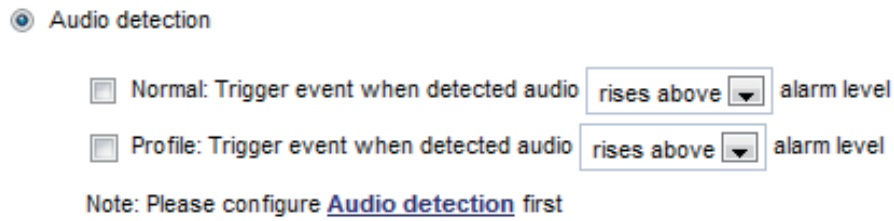
■ Digital input
This option allows the Network Camera to use an external digital input device or sensor as a trigger source. Depending on your application, there are many choices with digital input devices on the market which help detect changes in temperature, vibration, sound, light, etc.

■ System boot
This option triggers the Network Camera when the power to the Network Camera is disconnected.

■ Recording notify
This option allows the Network Camera to trigger when the recording disk is full or when recording starts to overwrite older data.

■ Audio detection

A preset threshold can be configured with an external microphone as the trigger to system event. The triggering condition can be an input exceeding or falling below a threshold. Audio detection can take place as a complement to motion detection or as a method to detect activities not covered by the camera's view.



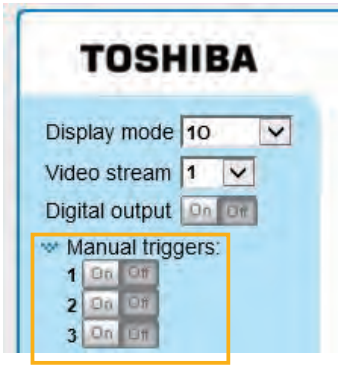
Once you have a preset audio alarm level, you can define the triggering condition either as an audio input rises above or falls below the alarm level.

■ Camera tampering detection

This option allows the Network Camera to trigger when the camera detects that is is being tampered with. To enable this function, you need to configure the Tampering Detection option first. Please refer to page 112 for detailed information.

■ Manual Trigger

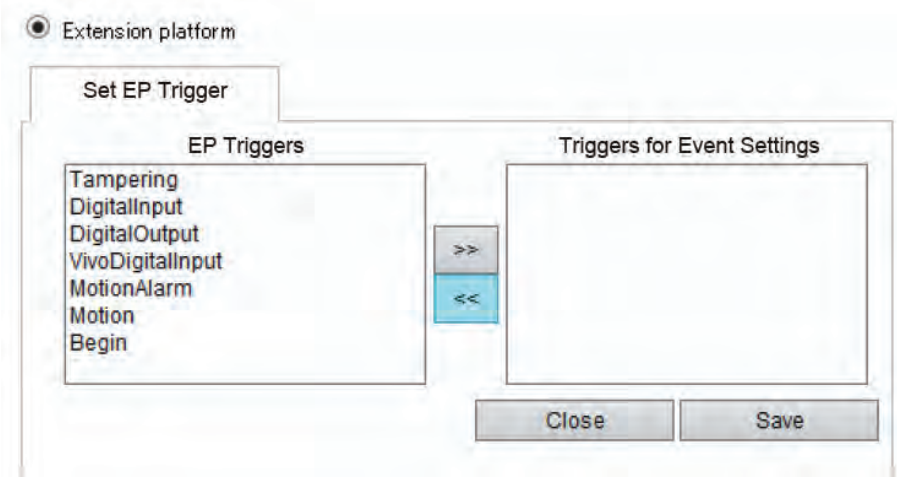
This option allows users to enable event triggers manually by clicking the on/off button on the homepage. Please configure 1 to 3 associated events before using this function.



■ Extension platform (EP)

It is presumed that you already uploaded and enabled the EP modules before you can associatee EP triggers with an Event setting.

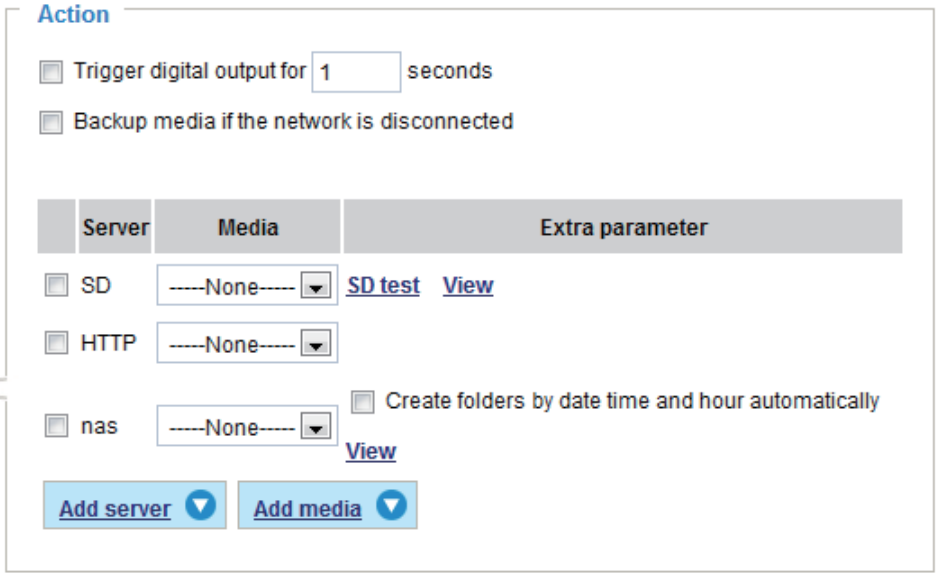
Click on the Set EP Trigger button to open the EP setup menu. The triggering conditions available with 3rd-party software modules known as EP will be listed. Use the arrow buttons to select these triggers. Users may implant these modules for different purposes such as triggering motion detection, or applications related to video analysis, etc. Please refer to page 115 for the configuration options with EP modules.



Once the triggers are configured, they will be listed under the EP option.

3. Action

Define the actions to be performed by the Network Camera when a trigger is activated.



■ Trigger digital output for ☐ seconds
Select this option to turn on the external digital output device when a trigger is activated. Specify the length of the trigger interval in the text box.

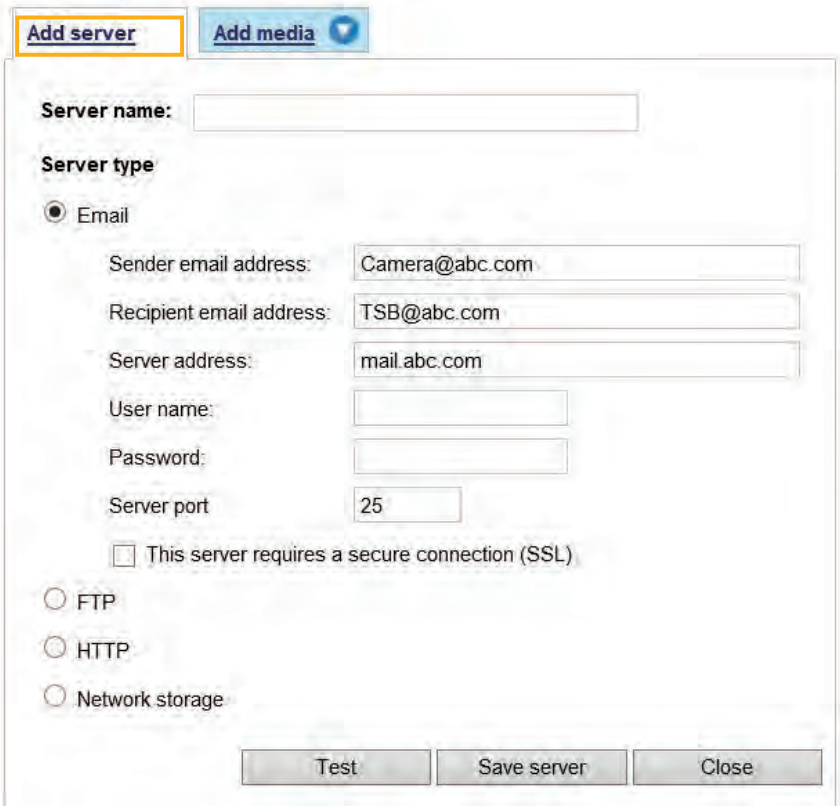
■ Backup media if the network is disconnected
Select this option to backup media file on SD card if the network is disconnected. This function will only be displayed after you set up a networked storage device (NAS).

Add server

To configure an event with video recording or snapshots, it is necessary to configure/provide servers and storage media settings so that the Network Camera will know where to send the media files to when a trigger is activated.

Click **Add server** to unfold the server setting window. You can specify where the notification messages are sent when a trigger is activated. A total of 5 server settings can be configured.

There are four choices of server types available: Email, FTP, HTTP, and Network storage. Select the item to display the detailed configuration options. You can configure either one or all of them.



Server type - Email
Select to send the media files via email when a trigger is activated.

■ Server name: Enter a name for the server setting.

■ Sender email address: Enter a valid email address as the sender address.

■ Recipient email address: Enter a valid email address as the recipient address.

■ Server address: Enter the domain name or IP address of the email server.

■ User name: Enter the user name of the email account if necessary.

■ Password: Enter the password of the email account if necessary.

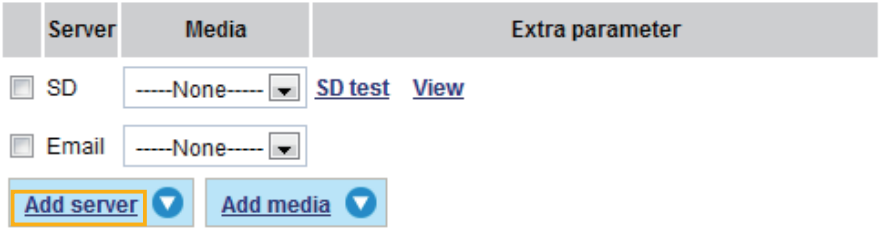
■ Server port: The default mail server port is set to 25. You can also manually set another port.

If your SMTP server requires a secure connection (SSL), check **This server requires a secure connection (SSL).**

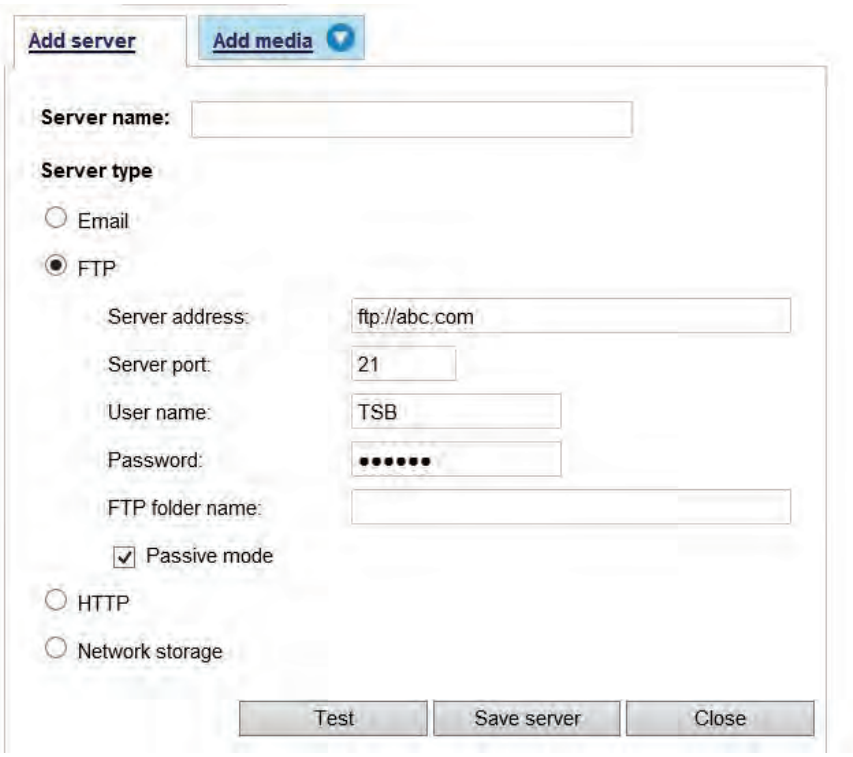
To verify if the email settings are correctly configured, click **Test**. The result will be shown in a pop-up window. If successful, you will also receive an email indicating the result.

Click **Save server** to enable the settings, then click **Close** to exit the Add server page.

After you set up the first event server, a new item for event server will automatically appear on the Server list. If you wish to add more server options, click **Add server**.



Server type - FTP
Select to send the media files to an FTP server when a trigger is activated.



■ Server name: Enter a name for the server setting.

■ Server address: Enter the domain name or IP address of the FTP server.

■ Server port: By default, the FTP server port is set to 21. It can also be assigned to another port number between 1025 and 65535.

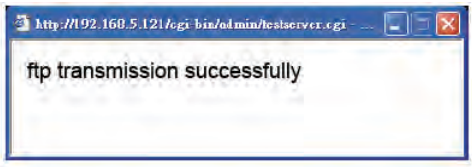
■ User name: Enter the login name of the FTP account.

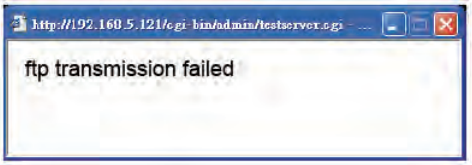
■ Password: Enter the password of the FTP account.

■ FTP folder name
Enter the folder where the media file will be placed. If the folder name does not exist, the Network Camera will create one on the FTP server.

■ Passive mode
Most firewalls do not accept new connections initiated from external requests. If the FTP server supports passive mode, select this option to enable passive mode FTP and allow data transmission to pass through the firewall.

To verify if the FTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window as shown below. If successful, you will also receive a test.txt file on the FTP server.





Click **Save server** to enable the settings, then click **Close** to exit the Add server page.

Server type - HTTP
Select to send the media files to an HTTP server when a trigger is activated.

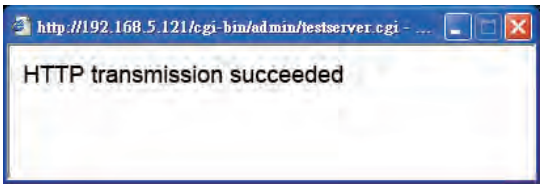
■ Server name: Enter a name for the server setting.

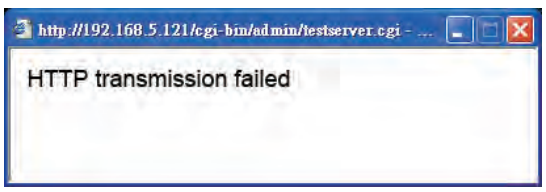
■ URL: Enter the URL of the HTTP server.

■ User name: Enter the user name if necessary.

■ Password: Enter the password if necessary.

To verify if the HTTP settings are correctly configured, click **Test**. The result will be shown in a pop-up window as below. If successful, you will receive a test.txt file on the HTTP server.

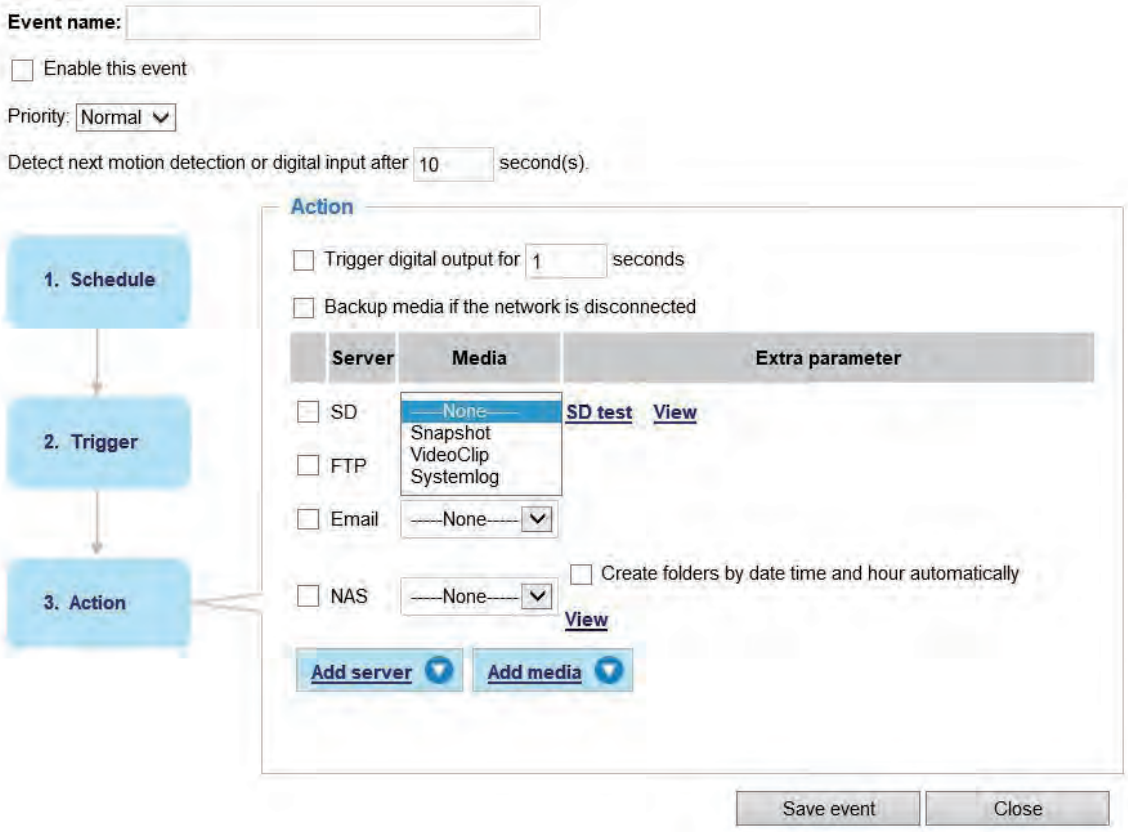




Click **Save server** to enable the settings and click **Close** to exit the Add server page.

Network storage:
Select to send the media files to a network storage location when a trigger is activated. Please refer to **NAS server** on page 119 for details.

Click **Save server** to enable the settings, then click **Close** to exit the Add server page.



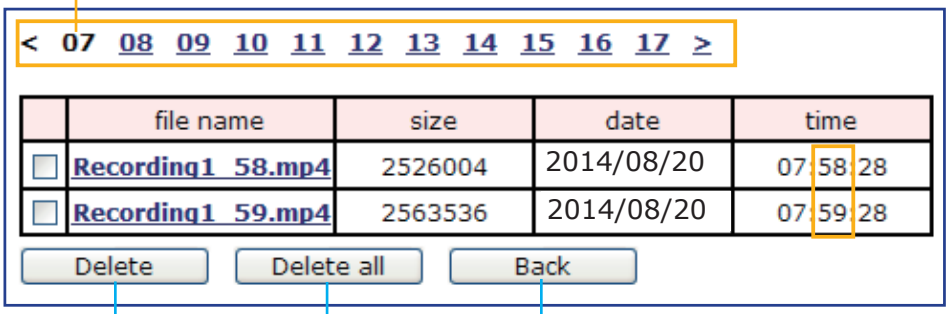
- SD Test: Click to test your SD card. The system will display a message indicating success or failure. If you want to use your SD card for local storage, please format it before use. Please refer to page 122 for detailed information.

- View: Click this button to open a file list window. This function is only for SD card and Network Storage. If you click the View button of SD card, a Local storage page will pop up for you to manage recorded files on SD card. For more information about Local storage, please refer to page 122. If you click the View button of Network storage, a file directory window will prompt for you to view recorded data on Network storage.For detailed illustration, please refer to the next page.

- Create folders by date, time, and hour automatically: If you check this item, the system will generate folders automatically by the date when video footages are stored onto the networked storage.

The following is an example of a file destination with video clips:

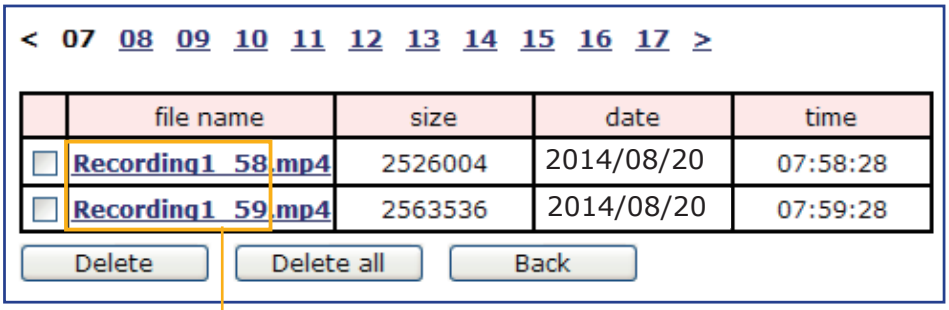
The format is: HH (24r)
Click to open the file list for that hour



Click to delete selected items

Click to delete all recorded data

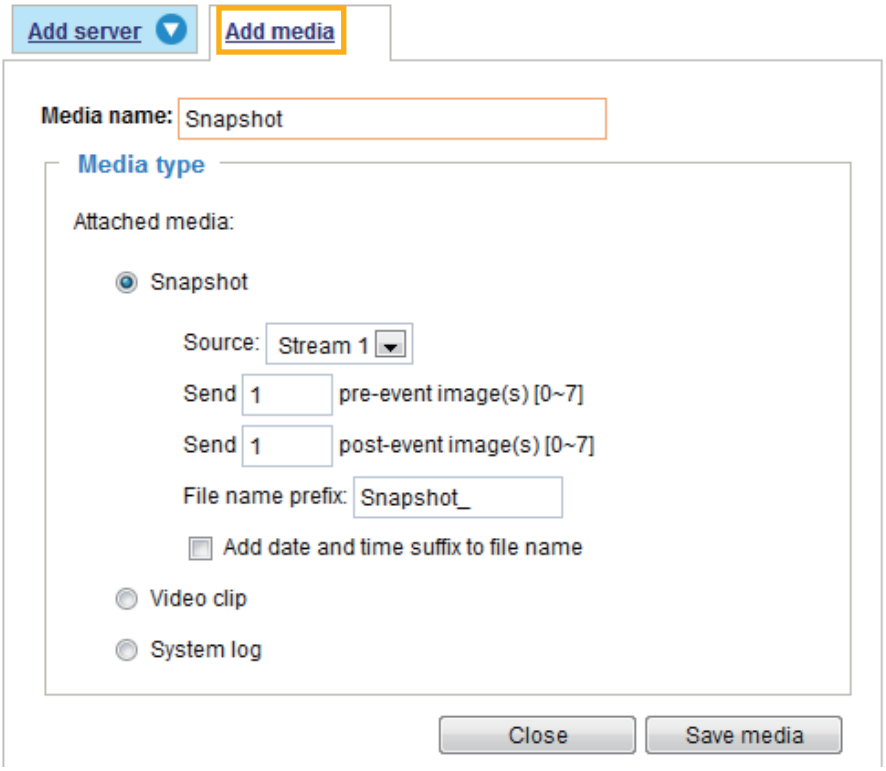
Click to go back to the previous level of the directory



The format is: File name prefix + Minute (mm)
You can set up the file name prefix on Add media page. Please refer to next page for detailed information.

Add media

Click **Add media** to open the media setting window. You can specify the type of media that will be sent when a trigger is activated. A total of 5 media settings can be configured. There are three choices of media types available: Snapshot, Video Clip, and System log. Select the item to display the detailed configuration options. You can configure either one or all of them.



Media type - Snapshot
Select to send snapshots when a trigger is activated.

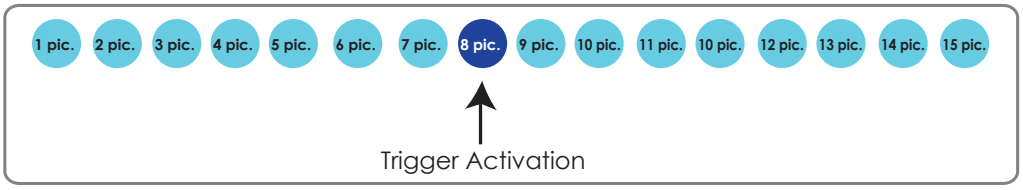
■ Media name: Enter a name for the media setting.

■ Source: Select to take snapshots from streams 1 ~ 4.

■ Send ☐ pre-event images
The Network Camera has a buffer area; it temporarily holds data up to a certain limit. Enter a number to decide how many images to capture before a trigger is activated. Up to 7 images can be generated.

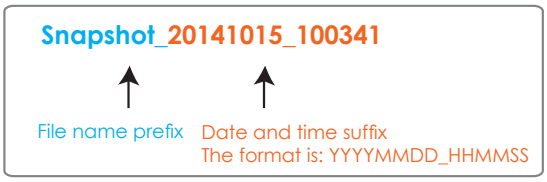
■ Send ☐ post-event images
Enter a number to decide how many images to capture after a trigger is activated. Up to 7 images can be generated.

For example, if both the Send pre-event images and Send post-event images are set to 7, a total of 15 images are generated after a trigger is activated.



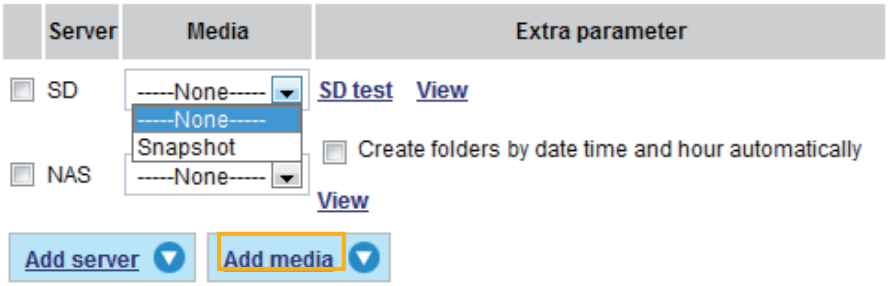
■ File name prefix
Enter the text that will be appended to the front of the file name.

■ Add date and time suffix to the file name
Select this option to add a date/time suffix to the file name.
For example:

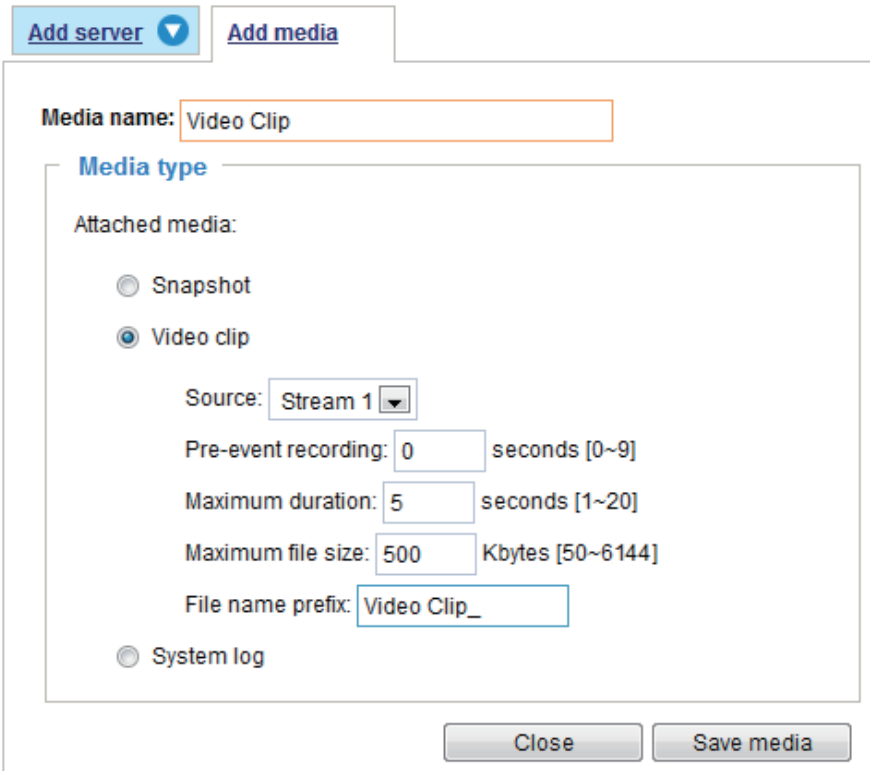


Click **Save media** to enable the settings, then click **Close** to exit the Add media page.

After you set up the first media server, a new column for media server will automatically display on the Media list. If you wish to add more media options, click **Add media**.

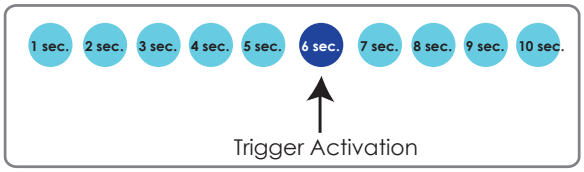


Media type - Video clip
Select to send video clips when a trigger is activated.

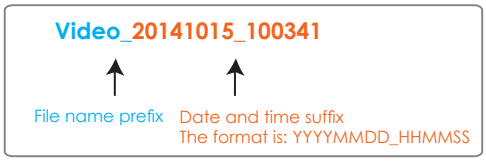


■ Media name: Enter a name for the media setting.
■ Source: Select the source of video clip.
■ Pre-event recording
The Network Camera has a buffer area; it temporarily holds data up to a certain limit. Enter a number to decide the duration of recording before a trigger is activated. Up to 9 seconds of video can be recorded.

■ Maximum duration
Specify the maximum recording duration in seconds. Up to 10 seconds of video can be recorded. For example, if pre-event recording is set to 5 seconds and the maximum duration is set to 10 seconds, the Network Camera continues to record for another 4 seconds after a trigger is activated.



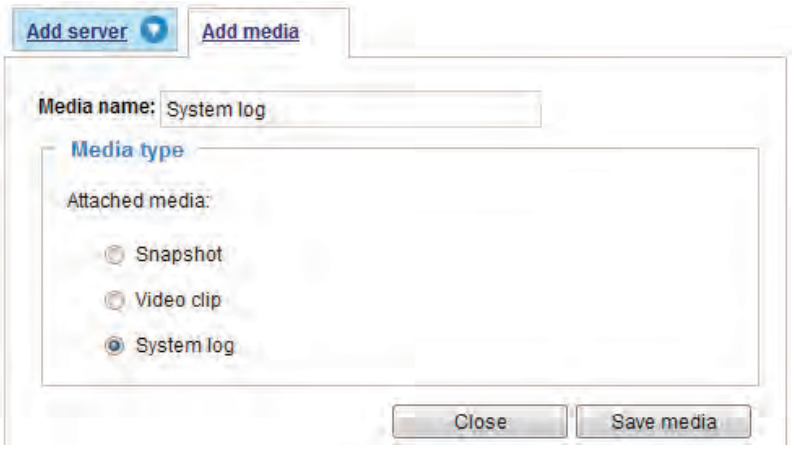
■ Maximum file size
Specify the maximum file size allowed. Set up sufficient size in consideration of the resolution, frame rate, and Pre/Post time. If file size is not enough, nothing may be recorded on SD card when event occurs.



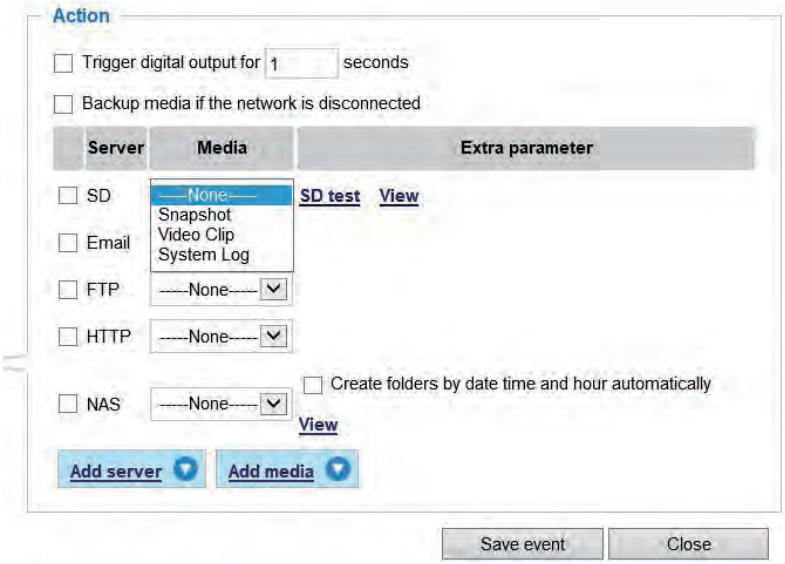
■ File name prefix
Enter the text that will be appended to the front of the file name.
For example:

Click **Save media** to enable the settings, then click **Close** to exit the Add media page.

Media type - System log
Select to send a system log when a trigger is activated.



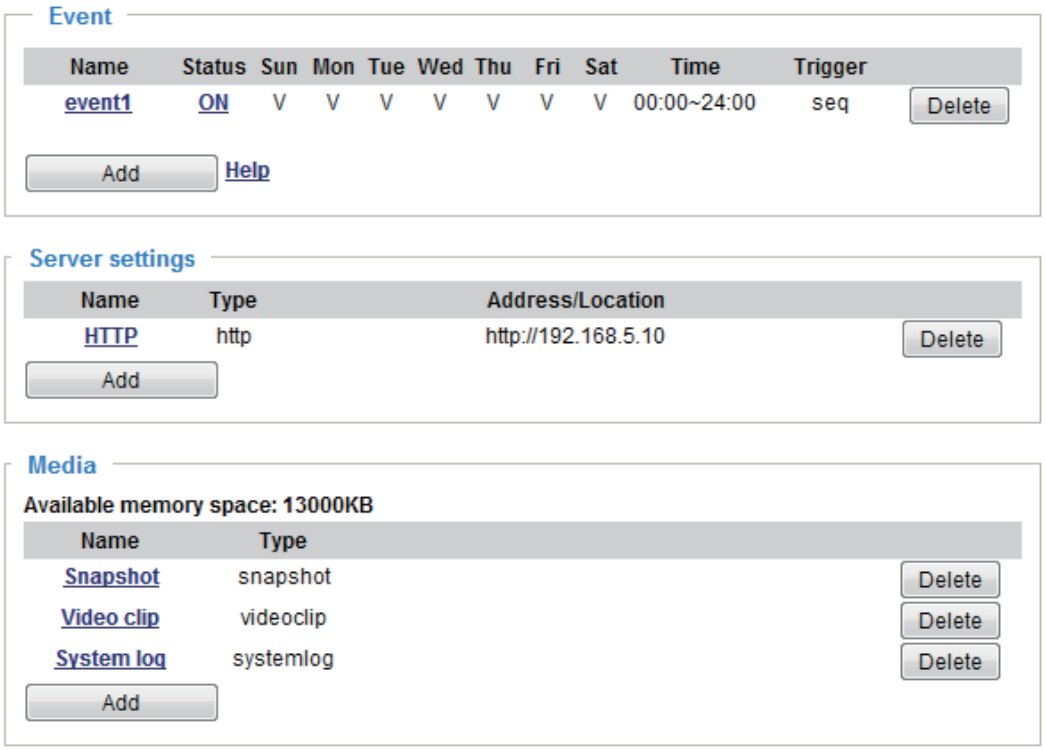
Click **Save media** to enable the settings, then click **Close** to exit the Add media page.



In the Event settings column, the Servers and Medias you configured will be listed; please make sure the Event -> Status is indicated as **ON**, in order to enable the event triggering action.

When completed, click **Save event** to enable the settings and click **Close** to exit Event Settings page. The new Event / Server settings / Media will appear in the event drop-down list on the Event setting page.

Please see the example of the Event setting page below:



When the Event Status is **ON**, once an event is triggered by motion detection, the Network Camera will automatically send snapshots via e-mail.

If you want to stop the event trigger, you can click **ON** to turn it to **OFF** status or click **Delete** to remove the event setting.

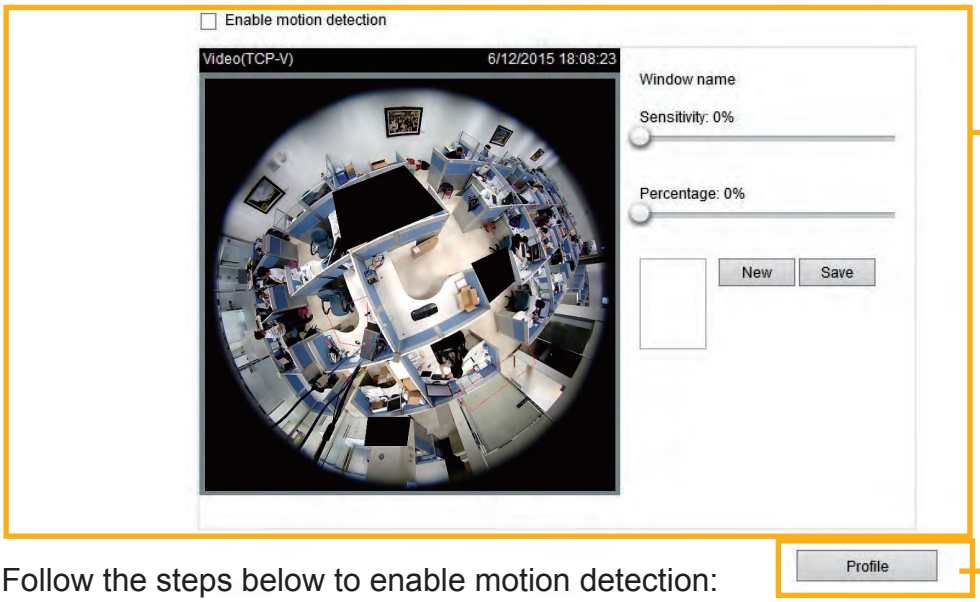
To remove a server setting from the list, select a server name from the drop-down list and click **Delete**. Note that you can only delete a server setting when it is not applied to an event setting.

To remove a media setting from the list, select a media name from the drop-down list and click **Delete**. Note that you can only delete a media setting when it is not applied to an event setting.

If you Power-OFF or remove the SD memory card from camera, you have to turn OFF the event status preliminarily.

Applications > Motion detection

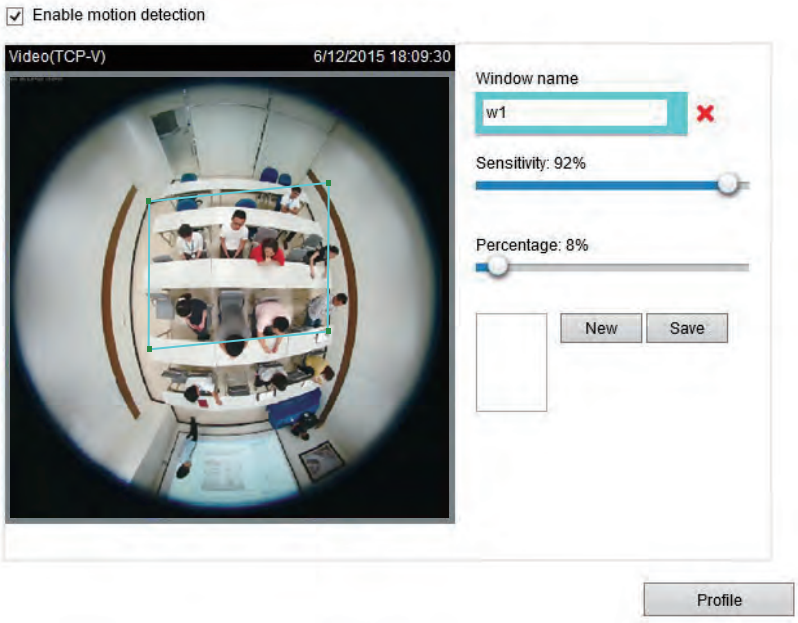
This section explains how to configure the Network Camera to enable motion detection. A total of three motion detection windows can be configured.



Follow the steps below to enable motion detection:

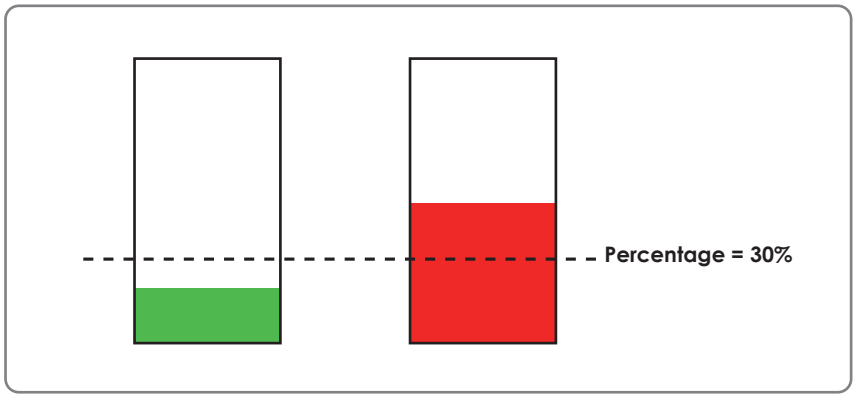
1. Click **New** to add a new motion detection window.
2. In the Window Name text box, enter a name for the motion detection window.
   ■ Use four mouse clicks to define the area where Motion Detection will take effect.
   ■ To change the four points of the rectangular, place your mouse cursor on any of it until it turns into a four-direction mark.
3. Define the sensitivity to moving objects and the space ratio of all alerted pixels by moving the Sensitivity and Percentage slide bar.
4. Click **Save** to enable the settings.
5. Select **Enable motion detection** to enable this function.

For example:

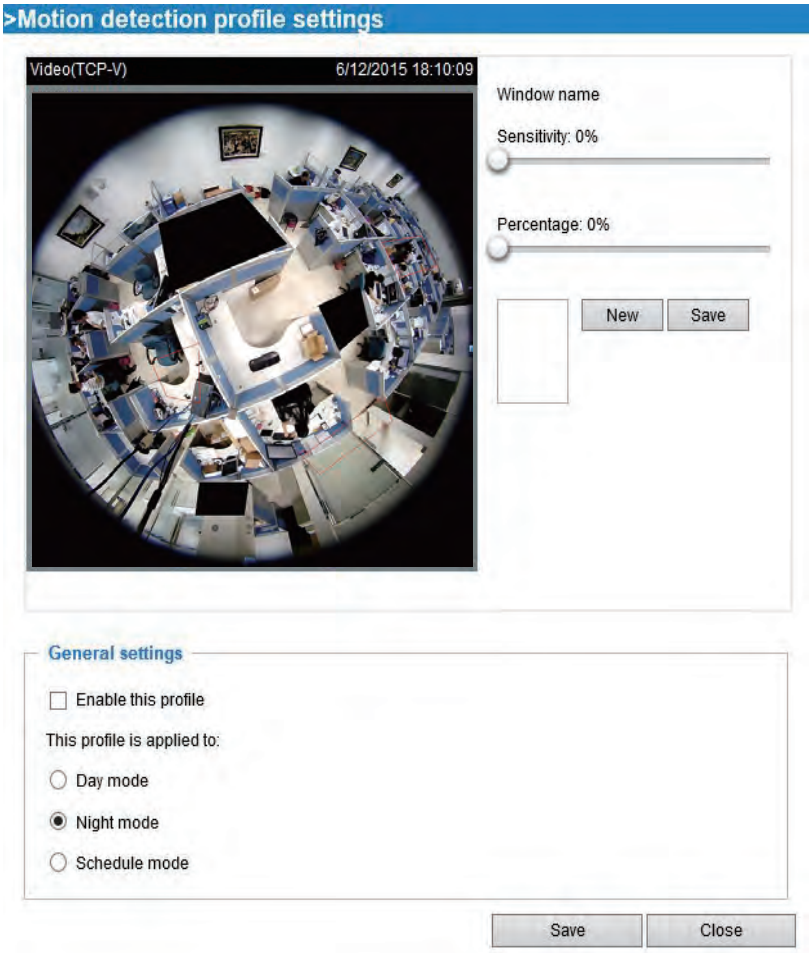


The Percentage Indicator will rise or fall depending on the variation between sequential images. When motions are detected by the Network Camera and are considered to have exceeded the defined threshold, the red bar rises. Meanwhile, the motion detection window will be outlined in red. Photos or videos can be captured instantly and configured to be sent to a remote server (Email, FTP) using this feature as a trigger source. For information on event settings, please refer to Event settings on page 95.

A green bar indicates that even though motions have been detected, the event has not been triggered because the image variations still fall under the defined threshold.



If you want to configure specific motion detection settings individually for day/night/schedule operations, please click **Profile** to open the Motion Detection Profile Settings page as shown below. A total of three motion detection windows can be configured on this page as well.

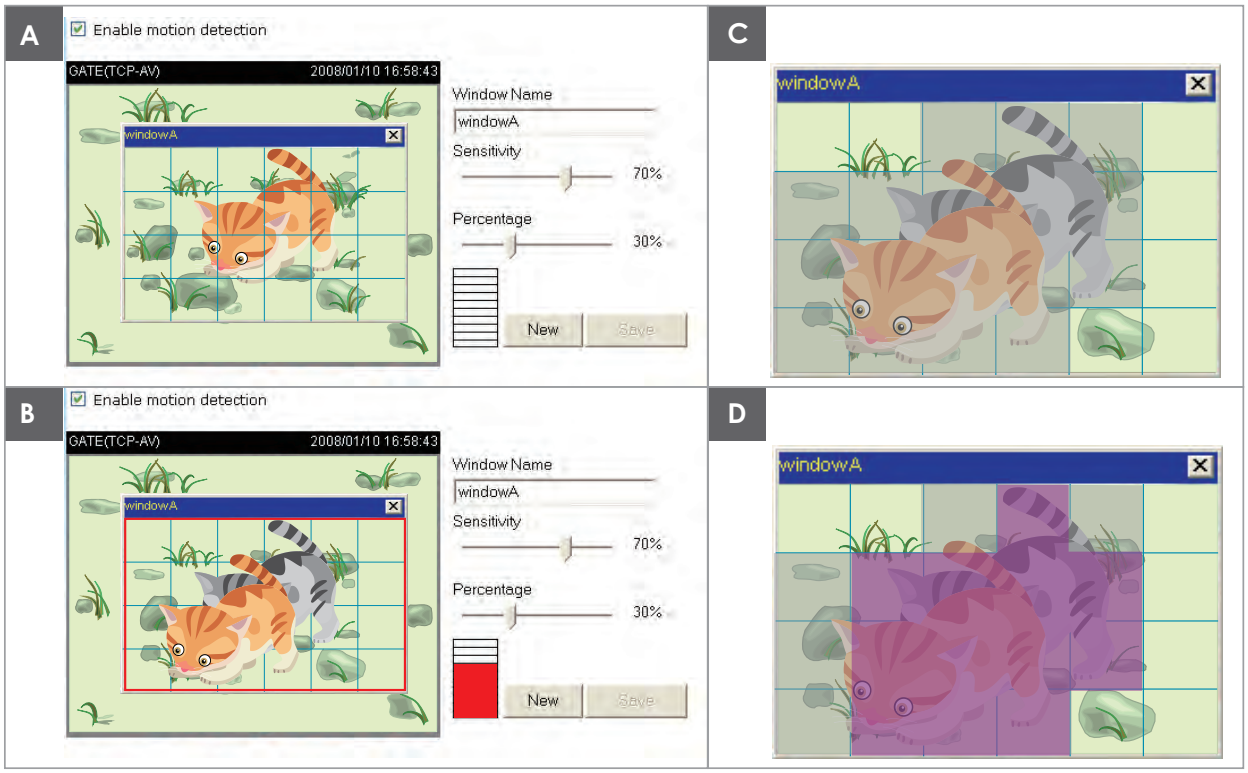


Please follow the steps beolw to set up a profile:
1. Create a new motion detection window.
2. Check **Enable this profile**.
3. Select the applicable mode: Day mode, Night mode, or Schedule mode. Please manually enter a time range if you prefer the Schedule mode.
4. Click **Save** to enable the settings and click **Close** to exit the page.

This motion detection window will also be displayed on the Event settings page. You can go to Event > Event settings > Trigger to choose it as a trigger source. Please refer to page 96 for detailed information.

NOTE

- How does motion detection work?

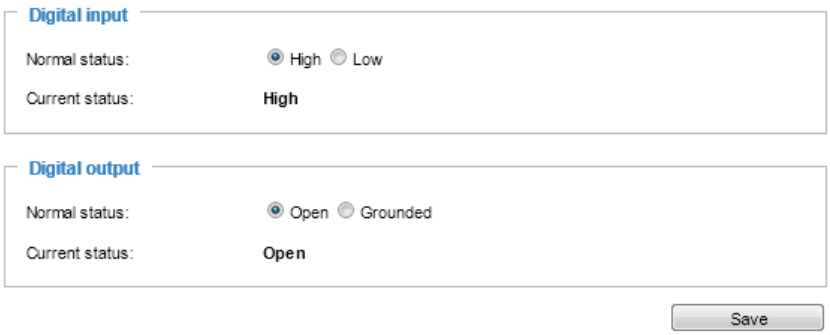


There are two motion detection parameters: Sensitivity and Percentage. In the illustration above, frame A and frame B are two sequential images. Pixel differences between the two frames are detected and highlighted in gray (frame C) and will be compared with the sensitivity setting. Sensitivity is a value that expresses the sensitivity to moving objects. Higher sensitivity settings are expected to detect slight movements while smaller sensitivity settings will neglect them. When the sensitivity is set to 70%, the Network Camera defines the pixels in the purple areas as “alerted pixels” (frame D).

Percentage is a value that expresses the proportion of “alerted pixels” to all pixels in the motion detection window. In this case, 50% of pixels are identified as “alerted pixels”. When the percentage is set to 30%, the motions are judged to exceed the defined threshold; therefore, the motion window will be outlined in red.

For applications that require a high level of security management, it is suggested to use **higher** sensitivity settings and **smaller** percentage values.

Applications > DI and DO



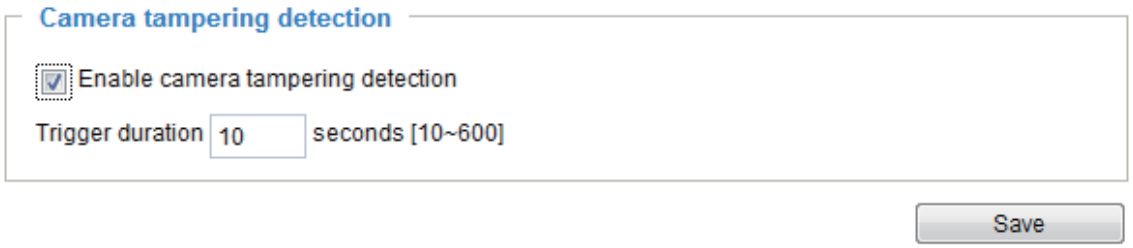
Connect DI or DO devices to the camera's terminal block, the camera will automatically detect the current connection state as pulled-high or pulled-low. You may then define the triggering condition.

Digital input: Select High or Low to define the "Normal status" for the digital input. The Network Camera will report the current status.

Digital output: Select Grounded or Open to define the "Normal status" for the digital output. The Network Camera will show whether the trigger is activated or not.

Applications > Tampering detection

This section explains how to set up camera tamper detection. With tamper detection, the camera is capable of detecting incidents such as **redirection**, **blocking or defocusing**, or even **spray paint**.

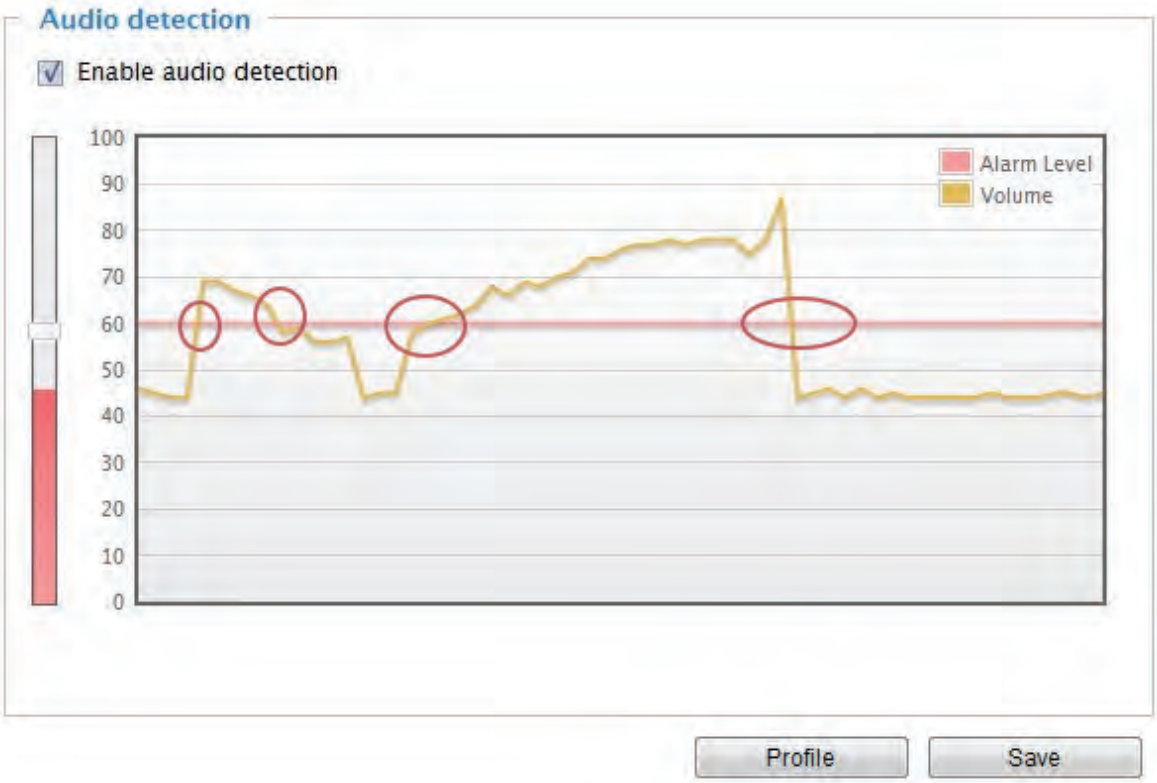


Please follow the steps below to set up the camera tamper detection function:

1. Check **Enable camera tampering detection**.
2. Enter the tamper trigger duration. (10 sec. ~ 10 min.) The tamper alarm will be triggered only when the tampering factor (the difference between current frame and pre-saved background) exceeds the trigger threshold.
3. Set up the event source as Camera Tampering Detection on **Event > Event settings > Trigger.** Please refer to page 96 for detailed information.

Applications > Audio detection

Audio detection, along with video motion detection, is applicable in the following scenarios:
1. Detection of activities not covered by camera view, e.g., a loud input by gun shots or breaking a door/window.
2. A usually noisy environment, such as a factory, suddenly becomes quiet due to a breakdown of machines.
3. A PTZ camera can be directed to turn to a preset point by the occurrence of audio events.
4. Dark environments where video motion detection may not function well.



The red circles indicate where the audio alarms can be triggered when breaching or falling below the preset threshold.

How to configure Audio detection:
1. Once the Audio detection window is opened, the current sound input will be interactively indicated by a fluctuating yellow wave diagram.
2. Use a mouse click to drag the Alarm level tab to a preferred location on the slide bar.
3. Select the “Enable audio detection“ checkbox and click Save to enable the feature.

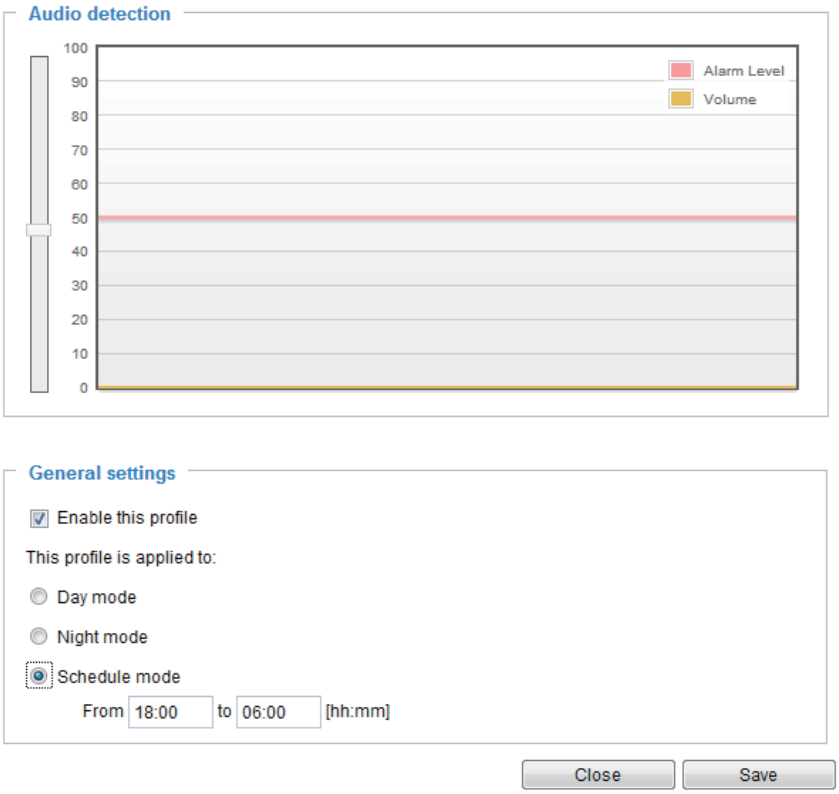
NOTE

1. Note that the volume numbers (0~100) on the side of wave diagram does not represent decibel (dB). Sound intensity level has already been mapped to preset values. You can, however, use the real-world inputs at your installation site that are shown on the wave diagram to configure an alarm level.

2. To configure this feature, you must not mute the audio in **Configuration > Audio and Video > Audio**.

You can use the **Profile** window to configure a different Audio detection setting. For example, a place can be noisy in the day time and become very quiet in the night.

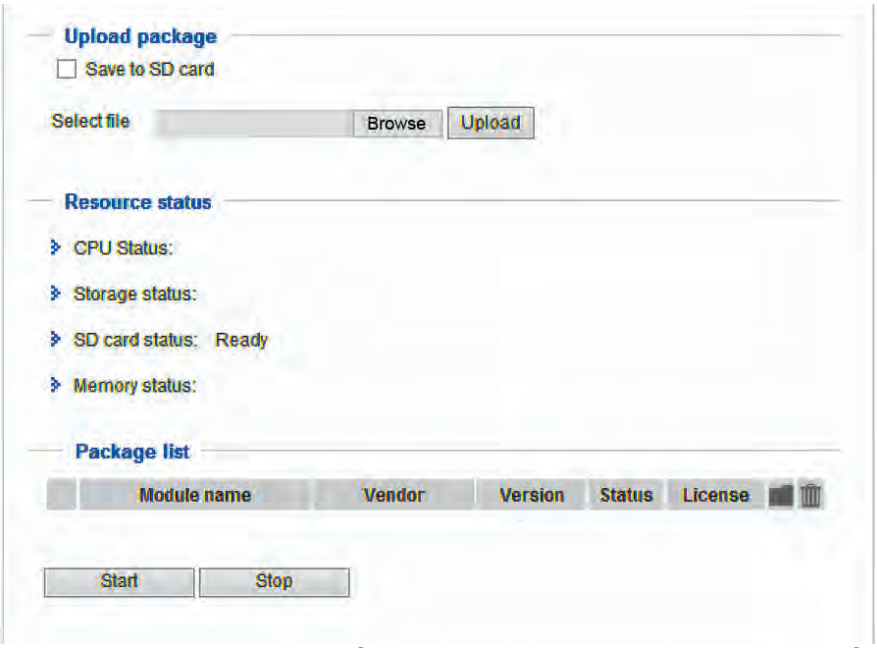
1. Click on the **Enable this profile** checkbox. Once the Audio detection window is opened, the current sound input will be interactively indicated by a fluctuating yellow wave diagram.
2. Use a mouse click to drag the **Alarm level** tab to a preferred location on the slide bar.
3. Select the **Day**, **Night**, or **Schedule** mode check circles. You may also manually configure a period of time during which this profile will take effect.
4. Click **Save** and then click **Close** to complete your configuration.



NOTE

- If the Alarm level and the received volume are set within a range of 20% on the wave diagram, frequent alarms will be triggered. It is recommended to set the Alarm level farther apart from the detected sound level.
- To configure and enable this feature, you **must not** configure video stream #1 into **Motion JPEG**. If an external microphone input is connected and recording of audio stream is preferred, audio stream is transmitted between camera and viewer/recording station **along with stream #1**.
- Refer to page 92 for Audio settings, and page 88 for video streaming settings.

Applications > Extension Platform



Users can store and execute 3rd-party software modules onto the camera's flash memory or SD card.

- Once the software package is successfully uploaded, the module configuration information is displayed. When uploading a module, the camera will examine whether the module fits the predefined Extension platform requirements.

- To enable extended analytics features, go to http://www.toshibasecurity.com/support/license for more information

To start a module, select the checkcircle in front, and click the **Start** button.

If you should need to remove a module, select the checkcircle in front and then click the **Stop** button. By then the module status will become **OFF**, and the **X** button will appear at the end of the row. Click on the **X** button to remove an existing module.

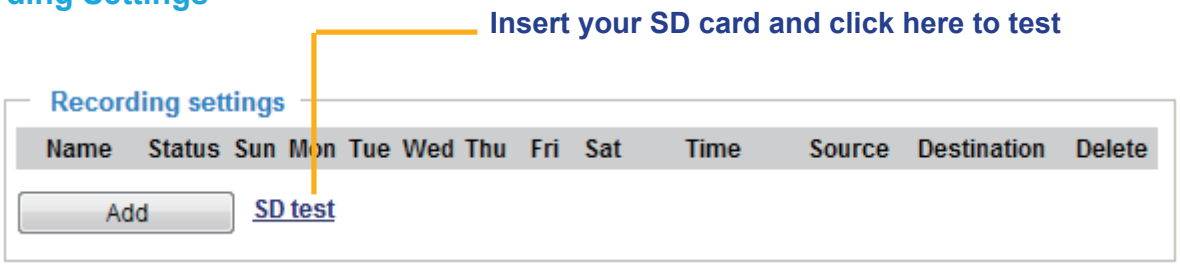
When prompted by a confirm message, Click **Yes** to proceed.

Note that the actual memory consumed while operating the module will be indicated on the **Memory status** field. This helps determine whether a running module has consumed too much of system resources.

Recording > Recording settings Advanced Mode

This section explains how to configure the recording settings for the Network Camera.

Recording Settings

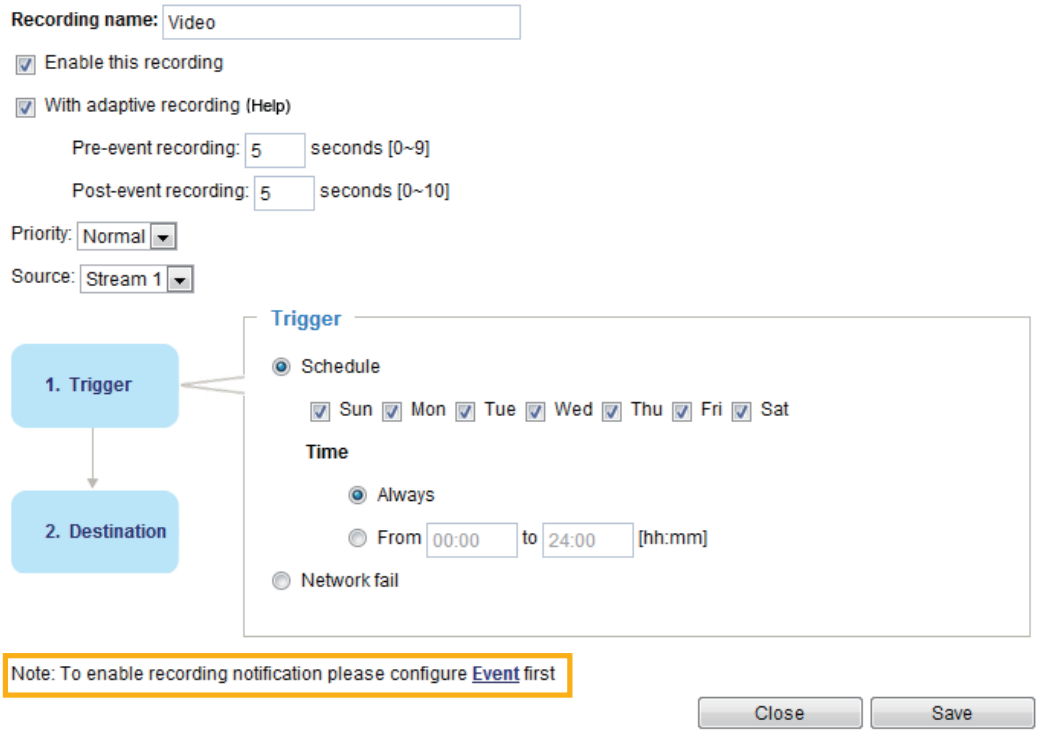


NOTE

- Please remember to format your SD card when used for the first time. Please refer to page 122 for detailed information.

Recording Settings

Click **Add** to open the recording setting window. On this page, you can define the adaptive recording, recording source, recording schedule, and recording capacity. A total of 2 recording settings can be configured.

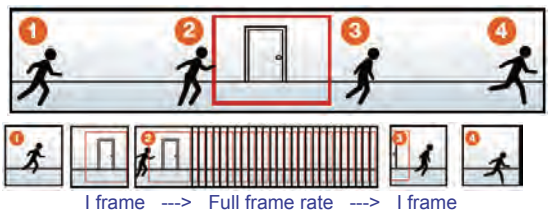


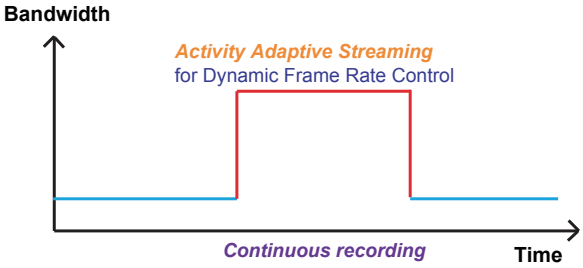
■ Recording name: Enter a name for the recording setting.

■ Enable this recording: Select this option to enable video recording.

■ With adaptive recording:
Select this option will activate the frame rate control according to alarm trigger. The frame control means that when there is a triggered alarm/event, the frame rate will raise up to the value you've set on the Stream setting page. Please refer to page 88 for more information.

If you enable adaptive recording and enable time-shift cache stream on Camera A, only when an event is triggered on Camera A will the server record the streaming data in full frame rate; otherwise, it will only request the I frame data during normal monitoring, thus effectively save lots of bandwidths and storage.





NOTE

- To enable adaptive recording, please make sure you've set up the trigger sources such as Motion Detection, DI Device, Manual Trigger, or Audio detection
- When there is no alarm trigger:
  - JPEG mode: record 1 frame per second.
  - H.264 mode: record the I frame only.
  - Mpeg4 model:record the I frame only.
- When the Intra frame period has been set to larger than >1s on Video settings page, the Intra frame period will be forced into 1s when the adaptive recording is activated.

■ Pre-event recording and post-event recording
The Network Camera has a buffer area; it temporarily holds data up to a certain limit. Enter a number to decide the duration of recording before and after a trigger is activated.

■ Priority: Select the relative importance of this recording (High, Normal, or Low). Recording with a higher priority setting will be executed first.

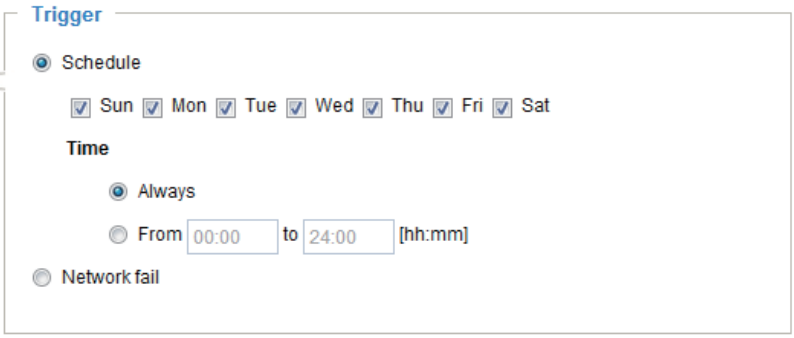
■ Source: Select a stream for the recording source.

NOTE

- To enable recording notification please configure ***Event* settings** first. Please refer to page 95.

Please follow steps 1~2 below to set up the recording:

1. Trigger
Select a trigger source.

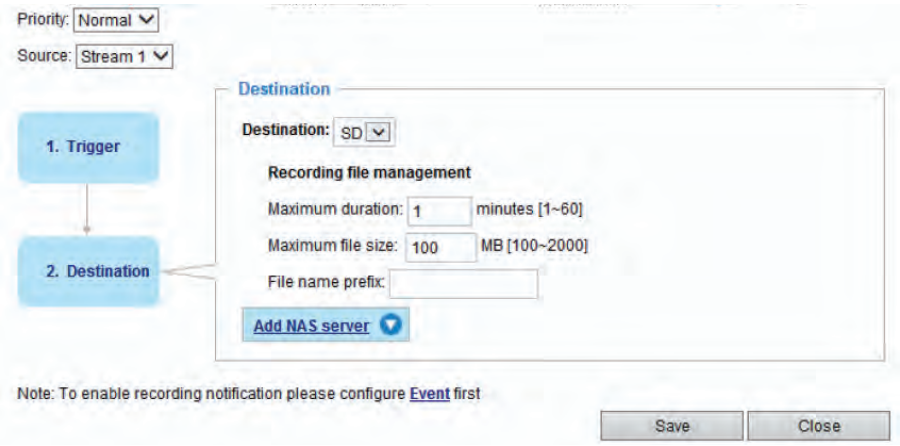


■ Schedule: The server will start to record files on the local storage (SD Card) or network attached storage (NAS).

■ Network fail: Since network fail, the server will start to record files onto the local storage (SD card).

2. Destination

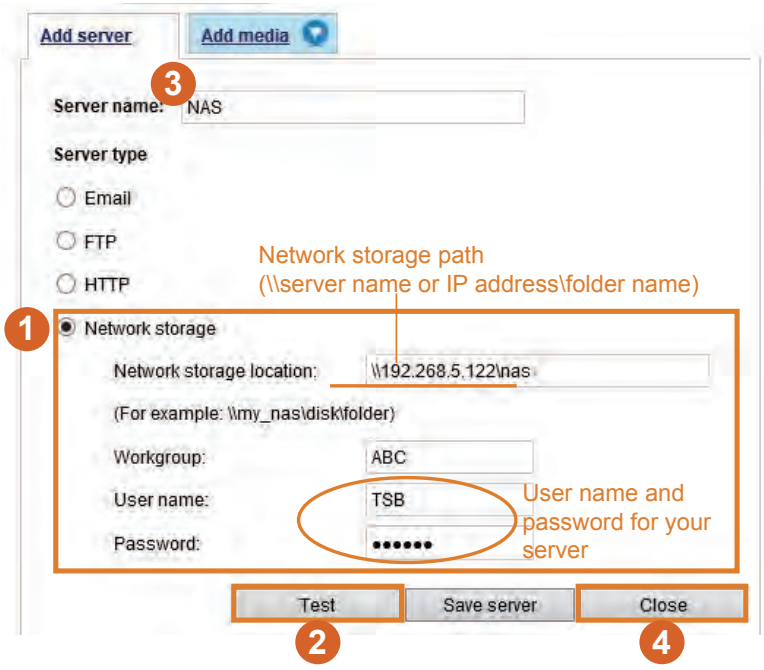
You can select the SD card or network storage (NAS) for the recorded video files. If you have configured a NAS server, see details in the following.



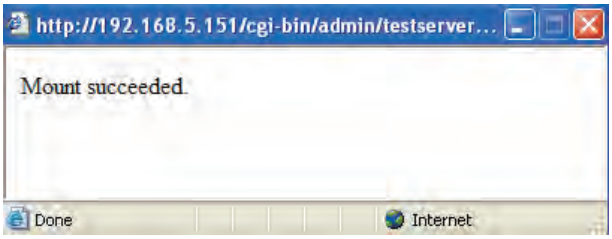
NAS server

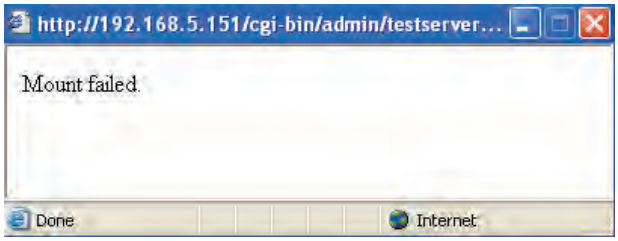
Click **Add NAS server** to open the server setting window and follow the steps below to set up:

1. Fill in the information for the access to the shared networked storage.
   For example:

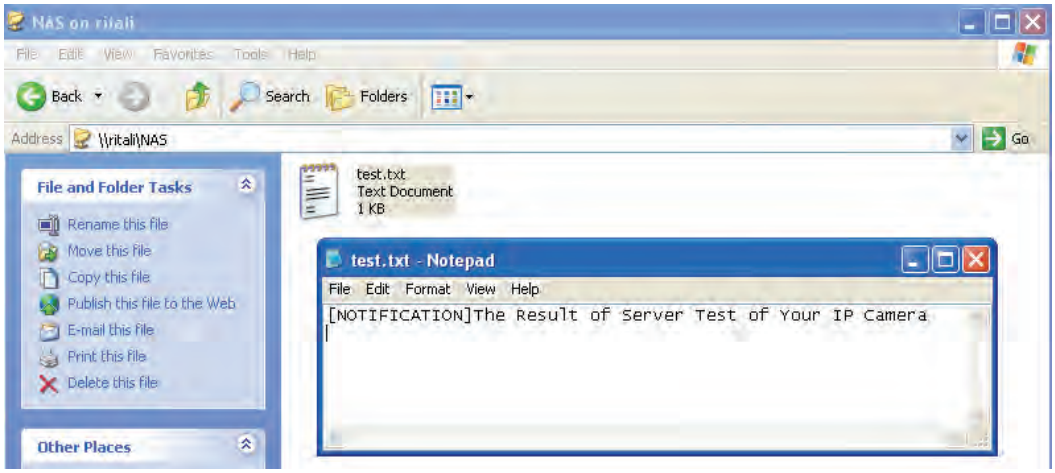


2. Click **Test** to check the setting. The result will be shown in the pop-up window.

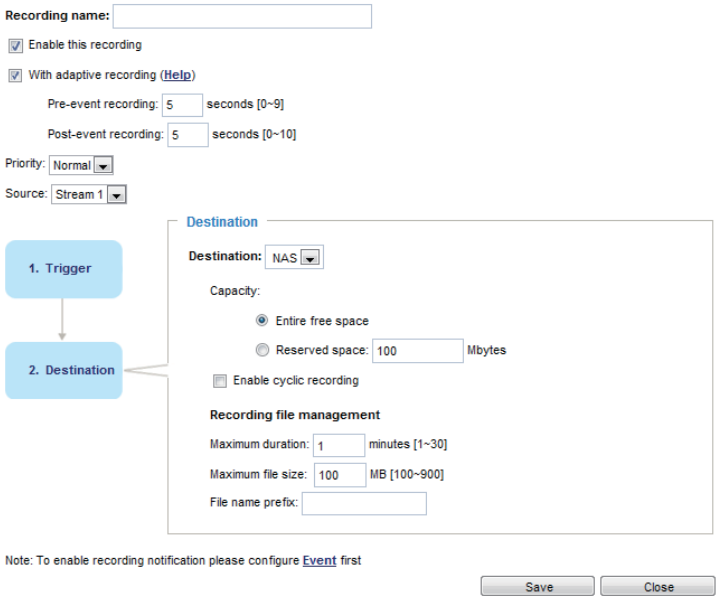




If successful, you will receive a test.txt file on the network storage server.



3. Enter a server name.
4. Click **Save** to complete the settings and click **Close** to exit the page.



■ Capacity: You can choose either the entire free space available or limit the reserved space. The recording size limit must be larger than the reserved amount for cyclic recording.

■ File name prefix: Enter the text that will be appended to the front of the file name.

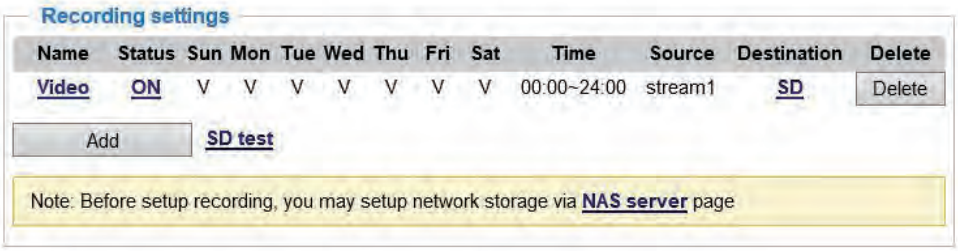
■ Enable cyclic recording: If you check this item, when the maximum capacity is reached, the oldest file will be overwritten by the latest one. The reserved amount is reserved for the transaction stage when the storage space is about to be full and new data arrives. The minimum for the Reserved space must be larger than 15 MBytes.

■ Recording file management: You can manually assign the Maximum duration and the Maximum file size for each recording footage. You may need to stitch individual files together under some circumstances. You may also designate a file name prefix by filling in the responsive text field.

If you want to enable recording notification, please click ***Event*** to configure event triggering settings. Please refer to **Event > Event settings** on page 95 for more details.

When completed, select **Enable this recording**. Click **Save** to enable the setting and click **Close** to exit this page. When the system begins recording, it will send the recorded files to the network storage. The new recording name will appear in the drop-down list on the recording page as shown below.

To remove a recording setting from the list, select a recording name from the drop-down list and click **Delete**.



- Click **Video (Name)**: Opens the Recording Settings page to modify.
- Click **ON (Status)**: The Status will become **OFF** and stop recording.
- Click **NAS (Destination)**: Opens the file list of recordings. For more information about folder naming rules, please refer to page 119 for details.
- Click **SD (Destination)**: Opens the Content management page of Local storage. For more information, please refer to page 123 for details.

If you Power-OFF or remove the SD memory card from camera, you have to turn OFF the recording status preliminarily.

Local storage > SD card management Advanced Mode

This section explains how to manage the local storage on the Network Camera. Here you can view SD card status, and implement SD card control.

SD card status

This column shows the status and reserved space of your SD card.

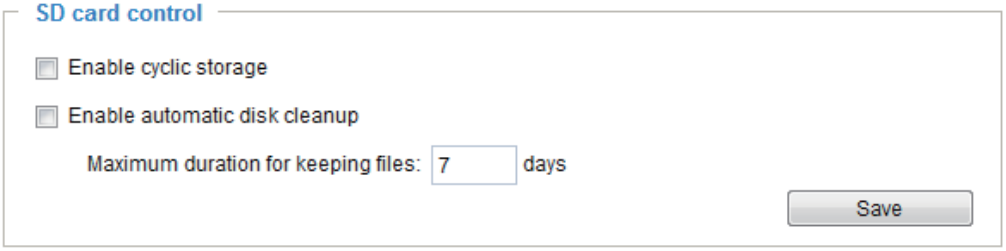
SD card format

Remember to format the SD card when using for the first time.

■ FAT32 : Standard file system Windows PC supported. Maximum 32GB SD card can be formatted.

■ Ext3 : Standard file system on Linux, Windows PC doesn't support directly.

SD card control



■ Enable cyclic storage: Check this item if you want to enable cyclic recording. When recording uses up all capacity, the oldest file will be overwritten by the latest file.

■ Enable automatic disk cleanup: Check this item and enter the number of days you wish to retain a file. For example, if you enter "7 days", the recorded files will be stored on the SD card for 7 days.

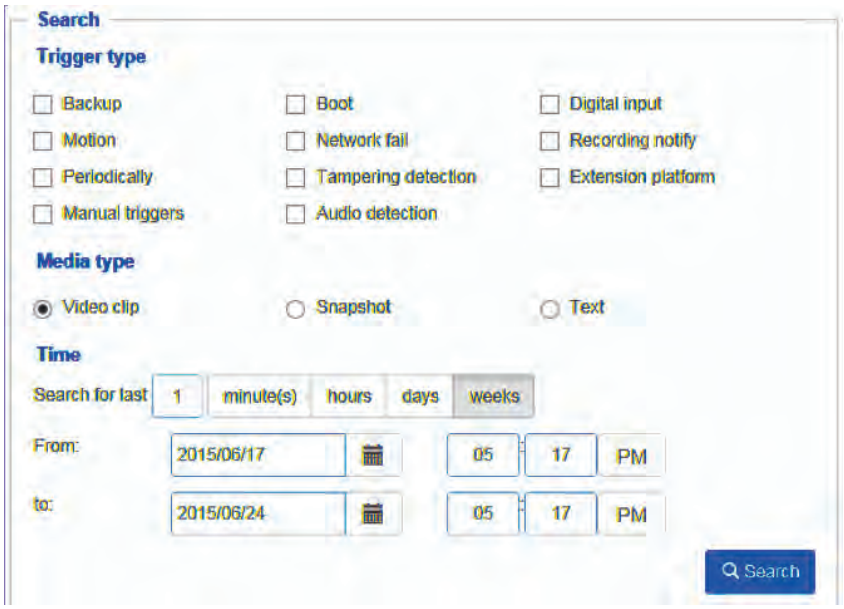
When all settings are completed, click **Save** to enable your settings.

Local storage > Content management Advanced Mode

This section explains how to manage the content of recorded videos on the Network Camera. Here you can search and view the records and view the searched results.

Searching and Viewing the Records

This column allows the user to set up search criteria for recorded data. If you do not select any criteria and click **Search** button, all recorded data will be listed in the **Search Results** cloumn.

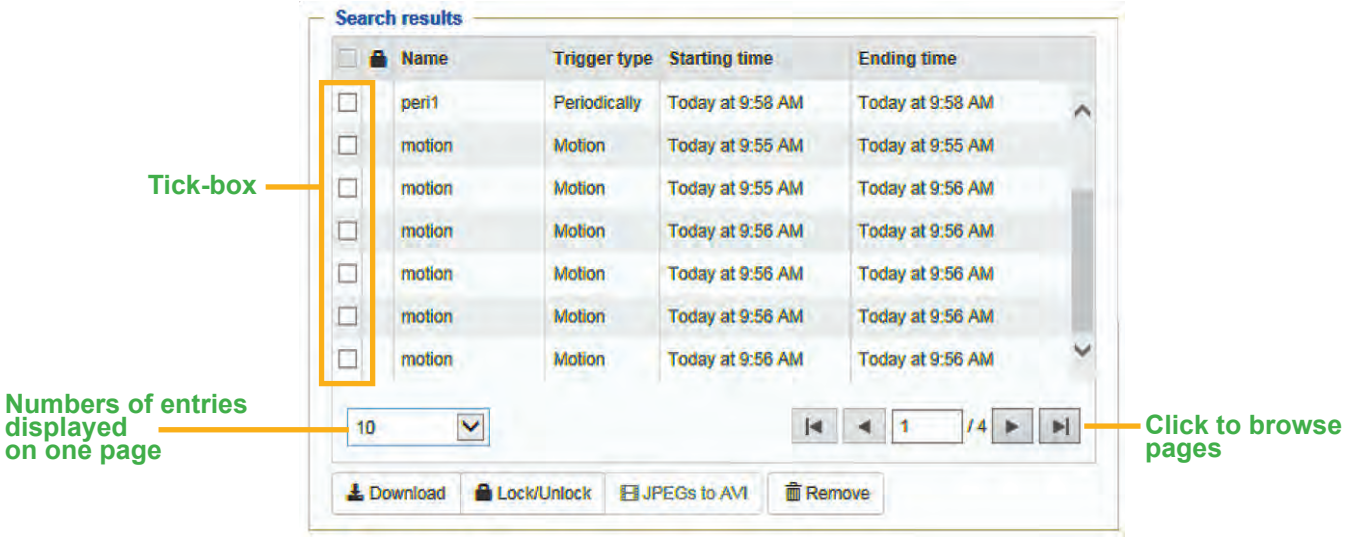


- Trigger type: Select one or more items as your search criteria.
- Media type : Select one you want to search.
- Time: Select and enter the time range you want to search.
  (Note: If time zone of camera and PC is different, set up camera's time in here.)

Click **Search** and the recorded data corresponding to the search criteria will be listed in **Search Results** window.

Search Results

The following is an example of search results. There are some columns: Name, Trigger type, Starting time and Ending time for Video clip. And Trigger type and Trigger time are for Snapshot and Text. Click ⇳ to sort the search results in either direction.



■ Play: Click on a search result which will highlight the selected item in blue. Click the Playback window will open automatically to play back the selected file.
For example:

Full screen, Pause, Playback, and Select function from the search results

Time line of video clip, and reload function. If clicked, all items on search results will be played back in series.

■ Download: Tick left tick-box to select the items. Then click the **Download** button and a file download window will pop up for you to save the file.

■ JPEGs to AVI: This function only applies to “JPEG“ format files such as snapshots. You can select several snapshots from the list, then click this button. Those snapshots will be converted into an AVI file.

■ Lock/Unlock: Tick left tick-box to select the items, then click this button. The selected items will become Locked, which will not be deleted during cyclic recoroding. You can click again to unlock the selections.

■ Remove: Tick left tick-box to select the items. Then click this button to delete the files.

Troubleshooting

Reset and restore

If an operational problem occurred in the camera, please refer to the Reset and Restore function on page 15.

Restoring the factory defaults will erase any previous settings.

Audio

When using multiple network cameras, restart Internet Explorer each time you switch the camera. Using the same Internet Explorer session for the multiple cameras may transmit multiple camera's audio.

External Microphone

The usable microphone is as follows.

- Plug-in-power Condenser Microphones
- φ3.5mm mini-jack

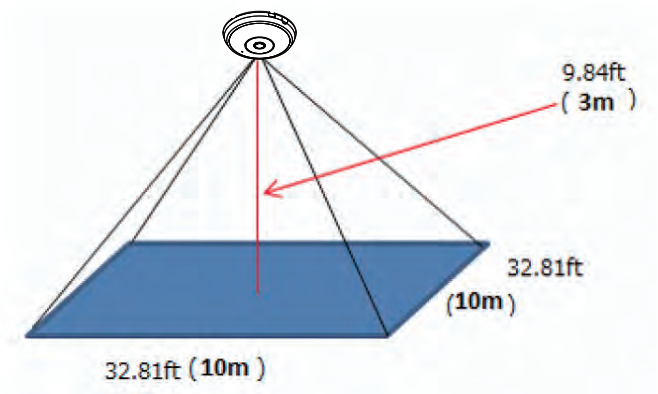
Recommended system requirements

Windows® 7 Professional
Internet Explorer® Ver 8.0
CPU: Intel® Core™ i3 or better
Memory: 1GB RAM and more

Recommended IR illuminator coverage

There is a limit in the brightness of IR illuminator, we recommend to install a camera within the limits of the following.

Plane : 32.81ft x 32.81ft (10m x 10m)
Distance : 9.84ft (3m)



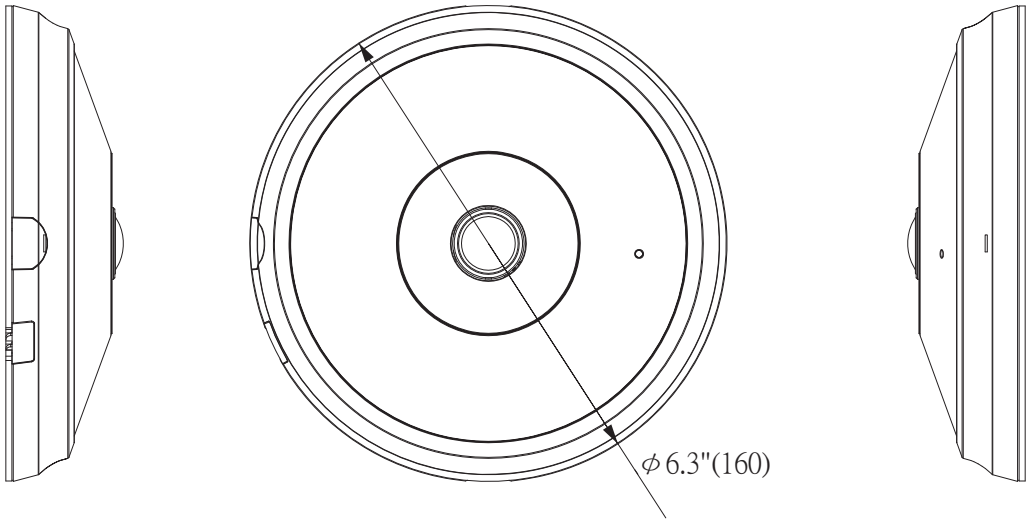
Specifications

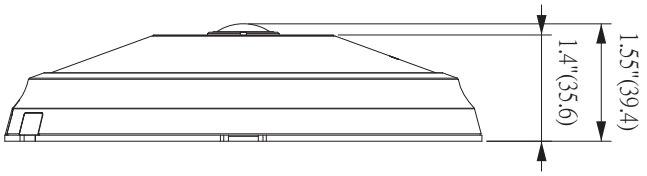
Power supply	12V DC ± 10 %, PoE(IEEE802.3af), PoE+(IEEE802.3at)
Consumption current	12V DC / 2.1 A,
Image pickup device	1/2.5 inch (4:3), 5Mp CMOS Digital Image Sensor
Maximum resolution	Horizontal 1920, vertical 1920 pixels
Scanning system	Progressive
Lens	Aperture F=1:2.8 Focal length f= 1.5mm
Angle of view (Typical value)	Horizontal 175° Vertical 175°
Day / Night	Removable IR-Cut filter in Night mode
IR illuminator	6 IR-LEDs with reflector
Minimum object illuminance	0.6 lux at Day mode, 0.01 lux at Night mode (F2.8, LED-OFF, Gain control 100%, Exposure time 1/30) 0 lux with IR illuminators
Noise Reduction	3D NR
Dynamic range	WDR enhancement
White balance	AWB (2,500K to 10,000K)
Image size of full view	1920x1920, 1536x1536, 1280x1280, 1056x1056, 768x768, 512x512, 384x384, 256x256, 192x192
Image compression system	H.264, MPEG-4, and JPEG
Micro SD Card	SD, SDHC, SDXC (Maximum 64GB)
Maximum frame rate at H.264 and M-JPEG (*1)	15 fps at 1920 x 1920, 30 fps at 1920 x 1080,
Maximum frame rate at MPEG-4 (*1)	15 fps at 1920 x 1920, 25 fps at 1920 x 1080,
Digital zoom	Maximum 12 times
Audio in / Audio out (*2)	Built in MIC, MIC IN (plug-in power 3.3V, 200kΩ) / LINE OUT (1 Vrms)
I/O terminal	Input 1, output 1
Network interface	10Base-T / 100Base-TX, RJ45 connector
Protocols	IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP, SMTP, FTP, DHCP, NTP, DNS, DDNS, PPPoE, CoS, QoS, SNMP, and 802.1X
OS	Windows® 7 professional
Browser	Internet Explorer® Ver. 8.0
ONVIF	Profile-S (test tool v14.12)
Operating temperature (*3)	14°F to 122°F (-10°C to 50°C)
Operating humidity	~ 90 %
Weight	589 g (1.3 lbs)
Dimensions	Φ6.3 x 1.5(H) inches (Φ160 x 39.4(H)mm) (excluding protrusion)
Safety regulation	UL 60950-1, CSA C22.2 No. 60950-1
EMC standard	FCC Class B, IC Class B
Accessories	Screws (x6), Anchors(x4), Power & I/O cable(x1), Cable ties (x2), Alignment sticker(x1), CD-ROM(x1), Quick Start guide and Important Safeguards(x1),Warranty Card(x1)

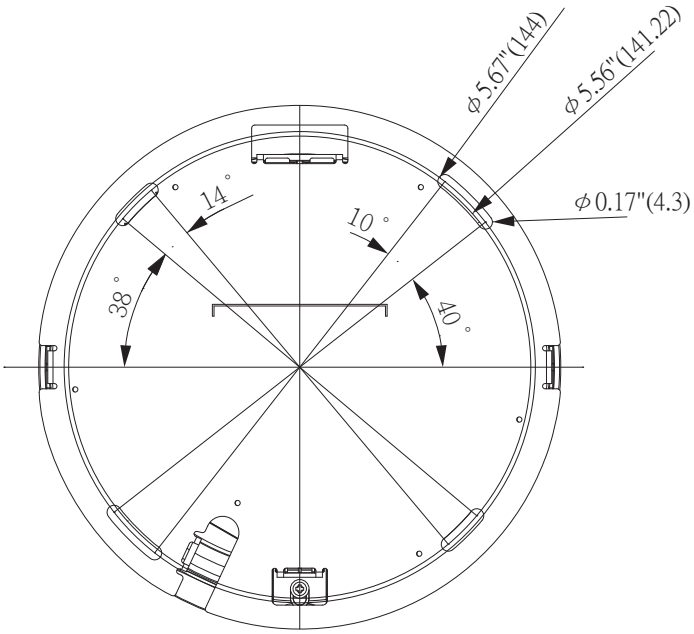
- *Designs and specifications may change without prior notice for better improvement.*
- *Screens, photos, illustrations and other diagrams contained in this user's manual may slightly change from actual ones.*

*1: Varies in accordance with the object, image quality, network environment and performance of the personal computer used.
*2: The sound may not be clear depending on the conditions of the lines.
*3: An internal heater is automatically turned on at low temperature, when a power supply is PoE+ and 12V DC.

Appearance Diagram







Dimensions: inch (mm)

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